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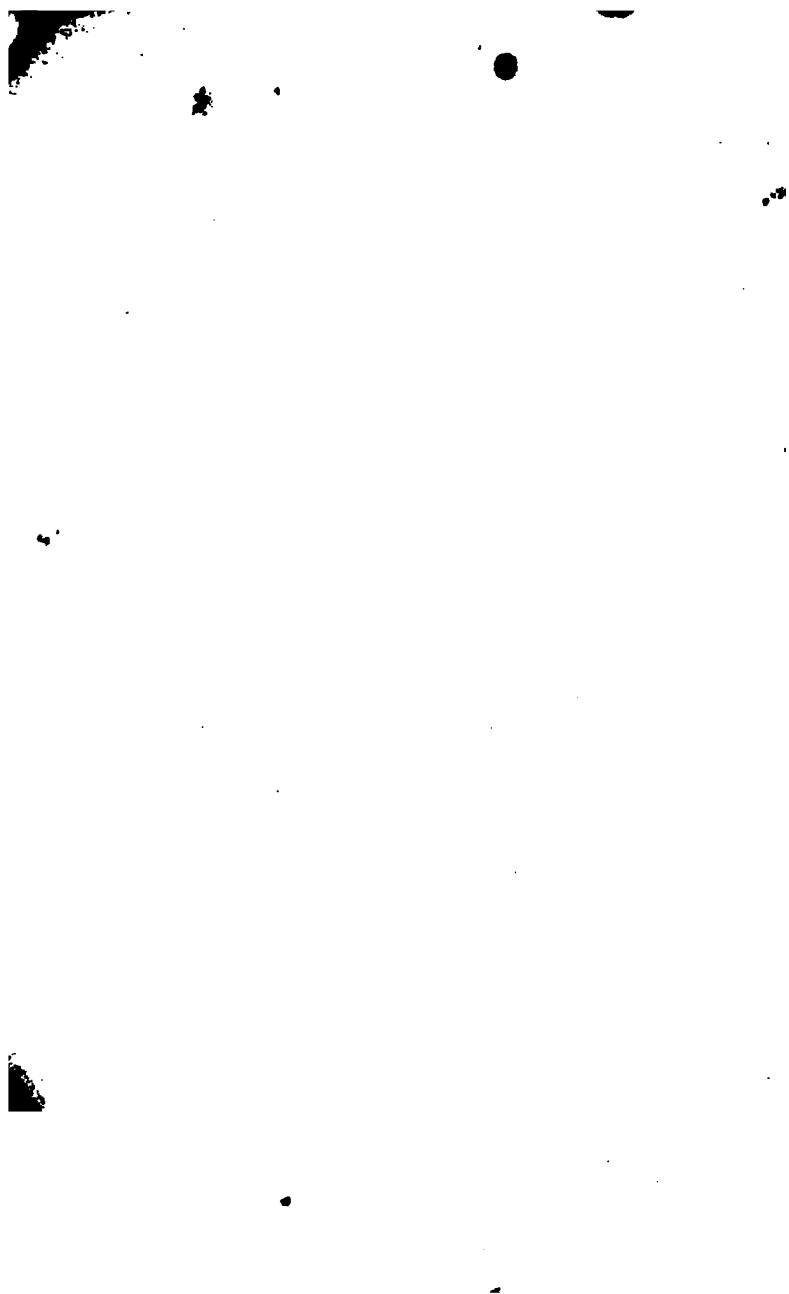
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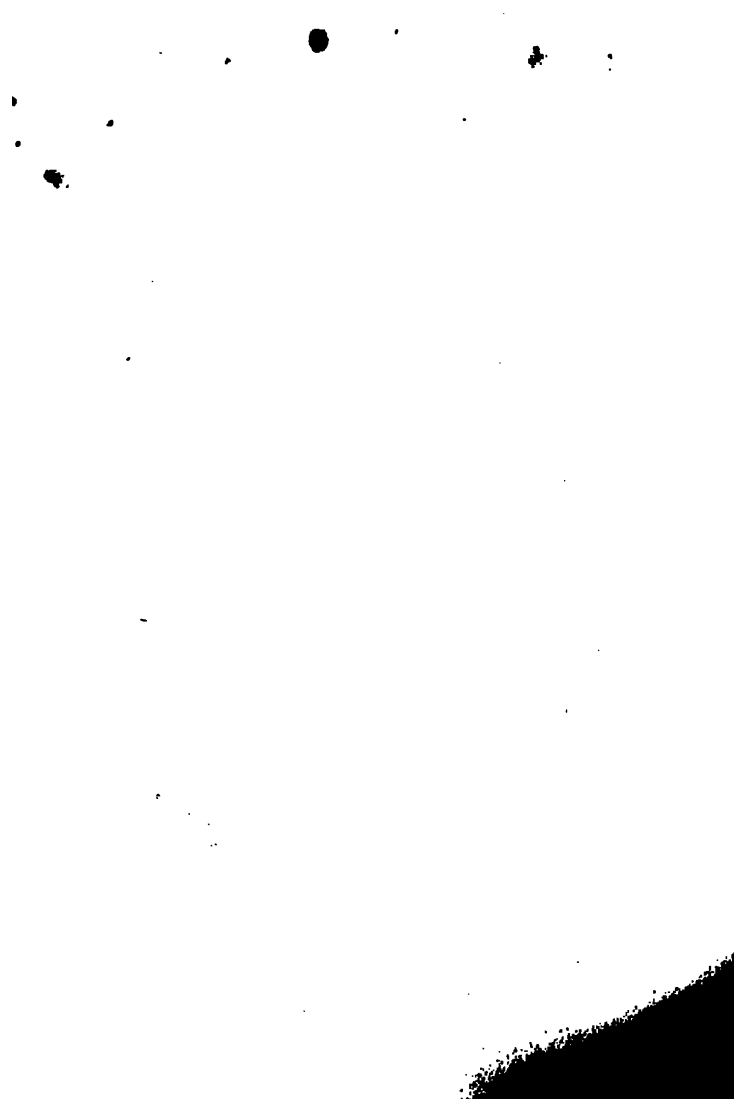




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PATENTS FOR INVENTIONS.

A BRIDGMENTS
OF
Specifications
RELATING TO
WEARING APPAREL.

DIVISION III.
FOOT COVERINGS.

A.D. 1693-1866.

PRINTED BY ORDER OF THE COMMISSIONERS OF PATENTS.



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PREFACE.

THE Indexes to Patents are now so numerous and costly as to render their purchase inconvenient to a large number of inventors and others, to whom they have become indispensable.

To obviate this difficulty, short abstracts or abridgments of the Specifications of Patents under each head of Invention have been prepared for publication separately, and so arranged as to form at once a Chronological, Alphabetical, Subject-matter, and Reference Index to the class to which they relate. As these publications do not supersede the necessity for consulting the Specifications, the prices at which the printed copies of the latter are sold have been added.

The number of Specifications from the earliest period to the end of the year 1866 amounts to 59,222. A large proportion of the Specifications enrolled under the old law, previous to 1852, embrace several distinct inventions, and many of those filed under the new law of 1852 indicate various applications of the single invention to which the Patent is limited. Considering therefore the large number of inventions and applications of inventions to be separately dealt with, it cannot be doubted that several properly belonging to the group which forms the subject of this volume have been overlooked. In the progress of the whole work such omissions will from time to time become apparent and be supplied in future editions.

This volume contains Abridgments of Specifications to the end of the year 1866. From that date the Abridgments will be found in chronological order in the "Chronological and "Descriptive Index" *see* (List of Works at the end of this book). It is intended however to publish these Abridgments in classes as soon as the Abridgments of all the Specifications from the earliest period to the end of 1866 have appeared in a classified form. Until that takes place, the reader (by the aid of the Subject-matter Index for each year) can continue his examination of the Abridgments relating to the subject of his search in the Chronological and Descriptive Index.

This volume, the third of the "Wearing Apparel" series, comprises the inventions relating to boots, shoes, slippers, clogs, pattens, goloshes, and overshoes. Besides these, it includes boot jacks—boot hooks—boot trees and stretchers—boot cleaning apparatus (not hand brushes)—blacking, dubbing, waterproof preparations, and varnishes for boots, &c.—shields for preventing splashing in walking—sewing machines specially constructed for sewing boots, &c.—eyeleting machines that relate to foot coverings (the bulk of the eyeleting machines will be found in Division II. of the "Wearing Apparel" series, and the manufacture of eyelets in Division IV.)—ventilating, drying, and warming boots, &c.—riveting boots, &c. (improvements in the rivets themselves will be found in the series entitled "Nails, Rivets," &c.—pegging boots, &c., and pegs (not metal)—sandals for protecting the feet of bathers, but not apparatus to be applied to the feet for facilitating swimming—elastic gussets for boots, &c., but not elastic fabrics that may be used for boots, &c.—hammering leather for boot and shoe-making, but not inventions for the preparation or dressing of leather; these are to be found in the series "Skins, Hides, and Leather"—inventions relating to artificial leather especially intended for uppers or soles, but not artificial leather generally. Spur boxes for heels are in the series entitled "Saddlery, &c."

B. WOODCROFT.

March, 1876.

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WEARING APPAREL.

DIVISION III.

FOOT COVERINGS.

A.D. 1693, April 22.—No. 322.

SYLVANUS, GEORGE.—“A new and extraordinary mixture
“of wax and other ingredients, knowne by the name of the
“German balls, which are of great vse for beautifying and
“preserving any sort of leather,” and will “prevent any wett
“entering into bootes and shooes.”

[No Specification. Letters Patent granted, price 4*l*.]

A.D. 1771, January 17.—No. 981.

BAYLEY, WILLIAM.—“Preparing a composition in cakes,
“rolls, or balls, or in any other solid form, for the making,
“by the addition of water only, an excellent shining liquid
“blackening for shoes, boots, or any other leather that requires
“to be kept black.” Mix together one part of “the gummy
“juice that issues in the months of June, July, and August
“from the shrub called the Goat’s Thorn,” four parts of river
water, two parts of neat’s foot or “some other softening lubri-
“cating oil,” two parts of superfine ivory black, two parts of
“deep blew prepared from iron and copper,” and four parts
of brown sugar candy. Let the water evaporate, and make
the composition into cakes “of such size that each cake may
“make a pint of liquid blackening.”

[Printed, 4*l*. No Drawings. See Repertory of Arts, vol. 8, p. 95.]

A.D. 1776, December 16.—No. 1141.

DANIEL, ROBERT.—“New kind of boots called spring boots.”
These boots are made with a spring of whalebone “fixed on

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"the inside of the back seam" to prevent them "from wrinkling and breaking in the back seam," and with two short whalebone springs "fixed fast in the heel" to prevent them from "treading back over the heel."

[Printed, 4d. No Drawings.]

A.D. 1778, March 6.—No. 1184.

BEAN, THOMAS.—"Invention of shoes, clogs, and pattens, called or known by the name of the Cleveland shoes, clogs, and pattens." These articles have (1) a spring lock or "catch screwed upon "the bump or thick part;" (2) a screw staple fixed on the sole "under the instep;" (3) a screw pin "projecting through the side" and "screwed to the lock or catch." This arrangement allows them to be "opened without any trouble" and prevents them "from sliding off the shoes or going forwards."

[Printed, 4d. No Drawings. See Rolls Chapel Reports, 6th Report, p.164.]

A.D. 1779, February 3.—No. 1210.

BURTON, JOSEPH.—"Improvements in women's clogs, by a "goloshoe or clog of an entire new make and invention."

[No Specification enrolled.]

A.D. 1782, April 18.—No. 1326.

CHAPMAN, CHARLES.—"Method of keeping up boots by "means of a silver, brass, or steel spring, on an entire new "construction, fixt in the boot above the calf of the leg, "whereby the wearer is released from the tedious and painful "assistance of buckle, string, strap, or garter, and the boots "kept up smooth."

[No Specification enrolled.]

A.D. 1783, January 13.—No. 1350.

STEDMAN, JOHN.—"A shoe and buckle upon an entire new "construction for the use of men or women." The bridge of the buckle nearest the toe is much thicker than the bridge nearest the instep. Two plates are fixed to the bridges in or near the middle of the buckle. Between the plates is a slider working in a groove or grooves made in the upper plates; it moves in a direction from toe to heel by means of a spring or springs secured between the plates. Small spikes are fixed on

the end of the under plate "nearest the instep;" they are fastened "in or under the ridge fixed on the upper part of the "vamp of the shoe." Over the upper plate is put "a piece "of foil covered with leather" or blackened; it is fastened under each end of the buckle by catches or hasps.

The shoe is made with "short straps," and eyes, hooks, or loops are fixed to their points. On the top of the vamp is a ridge for the reception of the spikes. Across the upper part of the vamp from strap to strap "goes a piece of catgut "or string" (covered or not with wire) or of wire, and to the ends thereof are fastened hooks, eyes, or loops, which are to be united to those on the short straps.

The slider operates on the catgut or wire.

[Printed, *id.* No Drawings.]

A.D. 1784, March 10.—No. 1421.

NASH, MICHAEL.—"Making blacking which effectually resists "moisture, prevents all kinds of leather from growing rusty "or mouldy, and preserves it from the pernicious effects of "salt water." Boil together "till every particle of scum is "defeated" 1 lb. or 1 cwt. (according to the quantity to be made) of spermaceti, the same quantity of clarified mutton suet, the same quantity of beeswax, and half the quantity of Venice turpentine. Then add half a pint or 7 gallons (according to the quantity to be made) of black japan, about $\frac{1}{3}$ th part of the same quantity of spirits of turpentine wherein resin has been dissolved (in the proportion of 1 to 5 of turpentine), and $\frac{1}{4}$ lb. or $\frac{1}{4}$ cwt. of ivory black "finely levigated." Boil all the ingredients together for about 15 or 16 hours, "stirring incessantly," until they are perfectly clear from any kind of froth or scum, and until "they have acquired a sufficient body when "cold to make into balls and sticks or cakes."

When the compound has been "exposed to the air for two "years," it will be "reducible to powder," and the powder dissolved in oil or varnish "will make a paste or liquid "blacking."

[Printed, *id.* No Drawings. See Rolls Chapel Reports, 6th Report, p. 168.]

A.D. 1784, November 26.—No. 1456.

TAYLOR, DAVID.—"New-invented buckle chape or shoe "fastening on a new construction." The buckle is made with

" a double chape or anchor, with one, two, or more spikes or prongs on each side thereof," and " with or without a joint." The outer chape may be made " with or without a projection or loop at one end," with studs or catches instead of prongs, or with " a plate of solid iron, &c. or otherwise, to which a false strap is or may be fastened ;" or it " may be used with only the straps of the shoe and may be fixed to the buckle rim by a pin and screw," nails, or rivets.

The inner chape, " of one solid plate or otherwise," may be fastened to the outer one by screw, rivet, or joint, or it may be fixed to the buckle rim ; it " is so jointed to the side or end of the chape next to the toe that it may fold or turn back " in order to give the buckle rim " liberty to fall down in the fore part of the foot." The inner chape has one or more catches or prongs on the end or side next the instep, " the use of which is to go into the vamp " of the shoe. In order to pull up the vamp a strap may be " cut, or slit out, or left on the said vamp," or a strap of any substance may be sewn on to it. The inner chape has prongs or studs or catches " on any part of it, whereon a false strap or top may be fastened, the use of which is to have the same portion or quantity of leather above the buckle rim to which said double chape is fixed, whether the said rim be high or low on the foot."

The method of fixing the buckle on the shoe is described in the Specification.

[Printed, &c. Drawing.]

A.D. 1785, March 22.—No. 1469.

GILLIES, ALEXANDER.—" A particular sort of clogs for the use and wearing of ladies and gentlemen." A " main spring of steel or other elastic metal and of the shape of the sole of the clog " is fixed between or above or under the inner and outer soles ; it reaches from the heel to the toe. In the back of the spring (" where it bends down to the heel ") a piece is cut out of the middle for the reception of a lock which exactly fits the opening and is screwed or otherwise fastened on. " The semicircular part of the lock " is flat on the surface, and " being placed in the box or heel-seat of the clog," the heel of the boot or shoe rests thereon. Under this part is a groove through which the shank of a bolt passes. " The nar-

“row part of the lock which stands upwards is bent to fit exactly” the opening of the main spring, and behind this part “where it bends towards the main spring” near the top is fixed a small spring “which reaches downward and presses upon the bolt, keeping it always shut.” Exactly opposite to the bolt an opening is made in the lower part of the “upright or narrow part;” this permits the bolt to pass freely through. A small hole is made “in the inside of the heel of the shoe exactly facing the bolt;” when the shoe is put into the clog, “the bolt immediately springs into the hole and fixes it firm and steady upon the foot.”

To take off the clog “it is necessary only to give a slight stroke or pressure to that part of the shank of the bolt which projects beyond the back part of the heel.”

The patentee describes a modification of the lock, which is only an inversion of the other.”

[Printed, *ed.* Drawing.]

A.D. 1785, May 13.—No. 1480.

MORSE, ANNE.—“A sandal clog.” The upper part is made of leather, cloth, or other material “cut into a point on the toe towards the buckle,” covering each side of the shoe about half way up, and, “terminated at each side with a strap.” The sole extends “to any part of the shoe sole, or heel, or under it.” The whole is fastened by a strap proceeding on each side from the said point to the said strap on each side of the upper part, and from thence round the quarter or heel of the shoe, and closed with a clasp, buckle,” or other kind of fastening.

[Printed, *4d.* No Drawing. See Rolls Chapel Reports, 6th Report, p. 171.]

A.D. 1785, November 3.—No. 1503.

WILLIS, JOSEPH, and SAUNDERS, WILLIAM.—“A new method of dressing and preparing leather with turned feet for boots, half boots, and spatterdashes or gaiters, and making boots, half boots, and spatterdashes or gaiters for men and women without any seam in the instep, by which means the foot will slide more easily in, and they will fit and turn water better than those now in use; and also of preparing leather for shoes, and making shoes without any heel-seam or side-seam.” Cut out from a skin of tanned leather a

piece of from 18 to 30 inches long and from 12 to 20 inches wide. Put the piece into cold water, and when well soaked shave it, scour it, wash it with a brush and cold water, and then sleek it. If it is grained leather, "black it with copperas water and immediately afterwards brush it off," using cold water; no copperas water is required for a "waxed leg." Cut the piece round "in the outlines of the leather to the size of the leg and foot of a man or a woman;" soften the smaller part of the leg with cold water, bruise it until it is soft, and sleek it "till it is reduced in breadth to 8, 9, 10, or 11 inches in the small of the leg" in order to give it "a proper draught;" then lay it in a frame having an iron fixed at each side (one being "moved by a screw to receive a leg of any size") in order to sleek it well.

"The manner of turning the foot":—Put the piece on an instrument in the shape of a leg and foot; bind the small part with a bandage of leather; wet with warm water for "a strong leg," with cold water for "a soft leg." Turn the bottom into the shape of a foot with pincers, using warm or cold water; nail it down and "pull the corners back" until "no foul leather remains at the ankles;" and then place it in a box at a small distance from a fire; a space of about 3 inches must be cut out of the box "where the instep lies" to prevent the heat from affecting any other part of the leg. Sleek it until it is "reduced into one inch and a half less than it was before." To make it more elastic work it with "spent oil and tallow." Hang it up by the heel to dry and afterwards soften it with "a graining board." If it is a waxed leg; whiten it "till it is brought to a proper flesh fit to be waxed" with suitable ingredients; if a grained leg, season it with copperas water and gall, then sleek it, grain it, soften it, whiten it inside, board it, and oil it with train oil.

Spatterdashes and gaiters do not require taking-in or framing.

To prepare leather for shoes without heel or side seam; double the leather, "cut before the straps," leave "breadth for the straps," cut the straps "down from the instep to the heel," turn it up "to cover the instep," last the upper leather, "bring the straps into their proper places and put the quarter over the heel of the last, and last it to sit tight."

[Printed, 4d. No Drawings. See Rolls Chapel Reports, 6th Report, p. 172.]

A.D. 1786, January 31.—No. 1526.

BULL, JOHN.—"A machine for the purpose of pareing, pumming, friezing, and grounding of leather used in the manufacturing of gloves, breeches, and shoes, and for binding of books, and for cutting out of shoes, slippers, gloves, mitts, and muffs, and for embellishing the same with ornaments in gold, silver, and colours." This machine consists of a cutting press at one end, a rolling press at the other, and a paring press between them.

The cutting press is worked by a screw and handle. Below the screw is a chest of drawers to contain the cutters, &c. when not in use. The leather, stretched in a suitably shaped frame, is laid on the chest or a block thereon; a cutter frame is placed on the frame, and the screw is caused to descend on to the frame.

The paring press consists of cylinders "whereon are fastened the pumice stones, pulverized glass, or the paring knives," and of adjustable rollers (on each side of the cylinders), "between which the skins are suspended and strained." The cylinders revolve by means of pinions working in the teeth of a horizontal wheel which is "turned on one center in the main beam" and on "another in the floor below."

The rolling press (for the purpose of impressing or of transferring impressions on to the leather) consists of a pair of rollers worked by means of a lever which throws pinions into gear with a wheel that turns the upper roller. The impression is engraved on a copper plate, which with the leather and the customary flannel is passed between the rollers.

The connecting parts of the machine and the working thereof are described in the Specification.

[Printed, 1s. Drawing. See Rolls Chapel Reports, 6th Report, p. 173.]

A.D. 1786, August 5.—No. 1555.

DUDLEY, WILLIAM.—"A buckle chape or fastening for men and women's shoes, with a new-constructed spring-jointed plate on which may be fixed any kind of rim, ornament, or device." The chape of the buckle is made with prongs at one end and with holes drilled through its sides for the admission of a wire which carries a pronged tongue. From one side projects a flat piece of metal having a hole drilled laterally

through it "about one [quarter of an inch] from the outer end, and carrying "a cutter standing erect about a quarter of "an inch high" and midway between the hole and the outer end.

The spring-jointed plate is somewhat bottle-shaped; the small end passes through one side of the buckle rim; the broad end is turned down to receive screws or rivets which fasten it to the opposite side of the rim. From about the middle to the broad end the plate is slotted, and a flat spring screwed to the plate fits into the slot. Near the broad end are two cheeks drilled for the reception of a wire which connects the projecting part of the chape to the plate.

When the chape and the plate are connected, the action is similar to that of a blade "against the spring in the handle "of a clasped knife," the cutter passing through a slot in the spring.

"In order to cover the works and to resemble a strap, there "is a piece of stiff leather or anything the shoe is made of "put between this plate and the rim;" it is kept in "by "the cutter cutting into it or pressing it against the rim."

The chape may be made double, and the attachment of the broad end of the plate to the rim may be modified.

[Printed, 6d. Drawing. See Rolls Chapel Reports, 6th Report, p. 174.]

A.D. 1788, June 30.—No. 1654.

TYLEE, JAMES.—"A shoe, slipper, and buckle to be affixed "thereto and worn therewith, on a new construction." The shoe and slipper are cut "without side seams;" the quarters (one a little longer than the other) are "closed even," and "the overplus hemmed to the shortest;" two or three straps are "cut in the same piece or cut separate and closed in the "fore part;" and a flap is sewn "to the fore part of the "shoe." A string to keep the quarters close "runs under "the turn-down of the quarter or the binding; it is fastened "by a sharp-pointed hook to the strap or to the buckle." The inside lining "is put in whole and sewed to the binding "or turn-down."

The inside works of the shoe buckle are "two chapes fixed "in the rim at an equal distance from the centre, which "operate with a purchase;" on the extremity of one are "three teeth pointing to the centre and two from it, and three

"near the middle pointing to the centre;" in the other are "three teeth pointing to the centre, with a sloped hole to receive a catch in the outside strap."

In the slipper buckle a bar, "round upon the upper part and hollow under," is "fixed in the centre of each bridge;" on the under part is "a slide spring with one catch and a stop that fastens in a box in a frame formed and calculated to answer the purpose of two chapes with holes to fasten the quarter strings and a cushion to." Two stops on the inside of the rim prevent the strap from springing out.

[Printed, 4d. No Drawings. See Rolls Chapel Reports, 6th Report, p. 179.]

A.D. 1788, August 15.—No. 1665.

JUKES, JOSEPH.—"An entire new-constructed fastening for boots, shoes, knee bands, and other purposes, to be used instead of buckles." A screw is fixed in the middle of a plate; it passes through a hole in the strap or straps of the article to be fastened, after which a rim or ornament with a hole in the middle "is placed so as to receive the screw through such hole;" an ornamental nut screwed on to the top completes the fastening. There should be several holes in the strap or straps so that the fastening may be varied as required.

If the ornament is in the shape of a buckle "or otherwise open in the middle," a cross bar must be added for making the central hole therein. There may be more than one screw and nut.

[Printed, 4d. No Drawings.]

A.D. 1789, May 2.—No. 1679.

HANDS, SAMUEL.—"New-invented spring shoe buckles." This invention consists of a spring which may be made "in a variety of forms, with few or many returns or doubles." A single spring is shaped somewhat like a horse shoe with the ends turned up higher than the middle portion. In a double spring there is a joint at the bottom of the inner returns and a lock or catch near the top. The outer portions terminate either with prongs or with turned-down ends "to hook over the straps of the shoe."

The lock consists merely of "a bolt and spring to make it act;" it is riveted to one side and receives a hook catch on the other side. The catch has one end secured round one side, its other end hooking round the other side.

An ornament may be worn with the spring; under it is fixed a slider "just wide enough to receive into it the middle part" of the spring. Or the ornament may be jointed to the spring and be closed down on it by a catch.

[Printed, 6d. Drawing. See Rolls Chapel Reports, 6th Report, p. 180.]

A.D. 1789, July 30.—No. 1695.

BULKELEY, JOHN.—"An ornamental steel case or outward covering for the heels of shoes, boots, and slippers of men, women, and children." This case may be made of any metal by rolling, hammering, casting, or moulding, and may be ornamented in any way according to taste. It may be secured to the heel in various ways, either by piercing so as to sew it on, by doubling over the top or bottom, or both, or by soldering, pinning, nailing, or screwing; it may be fixed permanently or temporarily.

[Printed, 4d. No Drawings. See Rolls Chapel Reports, 6th Report, p. 180.]

A.D. 1789, December 8.—No. 1715.

MAXWELL, JOHN.—"Spring fastenings for shoe buckles." The chape bar extends on each side; one end has a hole drilled through it, the other has a catch riveted to it.

The plate "on which the whole depends" is screwed at each end to the buckle rim; it is mortised at its narrow end, and the cheeks of the mortise are drilled to receive the pin which connects the chape bar to it. On the plate are riveted a "strap spring," which "lies in the mortise," a "latch," and a "latch spring." The broad end of the plate "is turned up square," and through the square part "is a hole to receive the steady pin at the broad end of the latch spring," also "an oblong hole for the latch to pass through and move in." Two guides, "turned down to a proper distance," receive and guide the catch.

The patentee describes the order in which the parts are to be put together as well as the action of the buckle.

[Printed, 6d. Drawing. See Rolls Chapel Reports, 6th Report, p. 181.]

A.D. 1790, January 23.—No. 1726.

LAW, RICHARD.—“An improved method of making shoe “buckles and chapes.” The buckle rim and the chape are detached from each other. The chape is made with a bridge which “leaves a vacancy to admit the inside strap of a shoe “between the chape and bridge.” Upon the bridge is a spring riveted or screwed to it.

Across the buckle rim (at or near the middle) is secured a slide, which “may be made to act with a joint or swivel at one “end thereof.” The slide has a groove in the under side; at the end of the groove a hole is drilled through it to admit the spring “to slide along till the end of such spring drops into “the said hole” and “effectually fastens or secures the “buckle rim.”

A spring fastened to the slide has at its free end a spike “that secures a leather or any other strap by means of the “top part of the bridge sliding upon such spring and pressing “the said pillar or spike against the strap, which confines it “against the under part of the buckle rim.” Or the strap may be secured “by means of a screw passing through the “slide.”

[Printed, 8d. Drawing. See Rolls Chapel Reports, 6th Report, p. 183.]

A.D. 1790, July 17.—No. 1764.

SAINT, THOMAS.—“An entire new method of making and “compleating shoes, boots, spatterdashes, clogs, and other “articles, by means of tools or machines also invented by “me for that purpose, and of certain compositions of the “nature of japan or varnish.” The patentee first describes his method of making the following varnishes:—(1) Boil together 1 gallon of linseed oil and 4 ounces of flax (as dressed for spinning) until the greatest part of the flax “is dissolved “or consumed.” By this time the oil “will have attained “the consistence of a thick jelly;” to bring it into a fluid state add (while it is hot) as much spirit or oil of turpentine as required and strain through flannel. To harden the composition dissolve in it 8 ounces of gum sandarac or mastic.

(2) Boil together 1 gallon of linseed oil, 2 ounces of dressed flax, and 6 ounces of umber until the oil “appears very brown “and thick.” Strain through flannel, add half an ounce of

stone brimstone, and boil again "till it has the appearance of melted pitch." If required, thin with spirit or oil of turpentine.

(3) Boil together 6 lbs. of stone pitch and 1 lb. of "flax dressers' hurds" until the hurds are consumed; add 8 ounces of stone brimstone; boil again, adding as much drying oil as "will render it of the consistence of good tar;" thin (if required) with spirit or oil of turpentine.

(4) Boil 1 pint of linseed oil and 4 ounces of stone brimstone "till they thicken and rise;" "pour it out to cool immediately;" melt with stone pitch until "it is fit for use," which will be if it melts when cool by the application of "a very hot iron." Thin (if required) with hot drying oil (composed of linseed oil, dressed flax, and sandarac, as in No. 1) and afterwards with spirit or oil of turpentine.

(5) Boil linseed oil and stone brimstone, and cool as in No. 4; dissolve in spirit or oil of turpentine until of a proper consistence for the intended use.

Secondly, his method of using the compositions :—Lay the material (whether of linen, cotton, or other fabric) on a smooth plate having a raised edge round it; put a fire under the plate; apply a coating of No. 3 or 4 as a ground by aid of a hollow heated roller; draw the coated material between heated rollers, and brush over it a coating of No. 1, 2, or 5; dry in a stove. The material thus prepared is useful for "the upper parts of shoes, boots, spatterdashes, clogs," &c. For leather work the coating in "with a hot iron with a round face." For the soles and heels of shoes, &c., "take millboard," lay it on the plate, pour on it No. 3 or 4, work in with the hot roller, dry in a stove, and finish off with No. 1, 2, or 5. Or make a pulp of old ropes, wool, cotton, &c., and add thereto an eighth part of No. 3. Or make a pulp of leather shavings with the addition of a twelfth part of No. 3. Mould the pulp into shape in a heated mould; press out as much moisture as possible and harden in a stove. "A number of points" may be fixed in the mould "for the stitching part," and "for the heel of women's shoes" a piece of wood may be put into the middle of the pulp. "Small pieces of any metal or metal calcined" may be mixed with the pulp to render soles more durable.

Annexed to the Specification is a sheet of drawings (with explanations) exhibiting (1) a machine "for spinning, twisting,

“ and doubling the thread or other materials;” (2), a machine “ for stitching, quilting, or sewing;” (3), a machine “ for platting or weaving.” The explanations are followed by “ the method of making shoes, boots, &c.” In the manufacture composition No. 3 is used to stick the inner and outer soles together as well as stitching, and the shoes, &c., are completed by the use of heated moulds and a screw press.

[Printed, 1s. Drawing.]

A.D. 1791, May 2.—No. 1801.

PEAL, SAMUEL. — “ An improved method of making and “ rendering perfectly waterproof all kinds of leather, cotton, “ linen, and woollen cloths, silks, stuffs, paper, wood, and “ other manufactures and substances, for the purpose of being “ worked up into shoes, boots, and other wearing apparel.” The directions given are :—Dissolve caoutchouc by distillation or infusion in a small quantity of spirits of turpentine, or other spirit, or “ most kinds of oil,” over a brisk fire. Give the leather, &c., a regular thin coating of the prepared caoutchouc; place it in a hot room or stove until it is nearly dry; repeat the processes as often as required, and let it remain after the last coating in the hot room or stove until the coating is perfectly dry.

The caoutchouc “ may be used with equal advantage in its “ native fluid state.”

[Printed, 4d. No Drawings.]

A.D. 1792, April 18.—No. 1870.

BURMAN, SAMUEL. — “ Newly invented half boot.” The vamp of this boot consists principally of two parts (called by the inventor “ the strap quarter ” and “ the lap quarter ”), which are united by “ the seam commonly called the back seam.” The back portion of the lap quarter “ is cut more full than the “ strap quarter, sloping from the bend of the heel to the top “ of the boot, in order that such seam may not be awry on “ the leg,” and a small piece must be taken out “ of the lap “ quarter from near the centre of the tongue of the vamp,” to make the lap quarter “ fit close over the instep.”

A piece of leather called a “ waterguard ” cut to a point at the bottom is sewed into the boot, and to the strap quarter; it may be sewed also if required to the inside of the lap quarter,

care being taken that there is room enough for the easy admission of the foot.

The strap quarter is cut with a strap in front. The lap quarter has a slit cut in it for the passage of the strap, and it has fastened to it a buckle, into which the strap takes after the lap quarter is passed round the leg over the waterguard and the strap quarter. The lower portion of the lap quarter is cut with a strap, which fastens to a buckle on the vamp over the instep.

Other modes of attachment than buckles and straps may be used. The closing, sewing, &c. of the boot are of the ordinary description.

[Printed, 10*d*. Drawing. See Rolls Chapel Reports, 6th Report, p. 186.]

A.D. 1792, May 3.—No. 1874.

PRIMEROSE, ANDREW.—“A new method of manufacturing “all sorts of feathers into men and women’s hats, head dresses, “muffs, tippets, and shoes.” The feathers are prepared by bleaching them in sour milk mixed with alum and pearl ash, secondly, by washing them with hot water, soap, and Prussian blue, and thirdly, by pressing them between the hands “before a strong fire, which restores them to their “original form.”

The patentee describes his method of introducing the feathers into a hat foundation, adding that “head dresses, muffs, tippets, and shoes are manufactured in the same manner.” The foundation is made of paper covered with a small network; the feathers are interwoven into the network, lapped over each other, and fixed with a preparation of gum arabic $\frac{1}{2}$ lb. and gum dragon $\frac{1}{2}$ lb. dissolved in 1 quart of cold water mixed with finely pounded Spanish whiting 4 oz. The mixture is heated and continually stirred over a slow fire until it boils; when cold it is fit for use.

[Printed, 4*d*. No Drawings. See Rolls Chapel Reports, 6th Report, p. 185.]

A.D. 1792, October 30.—No. 1914.

GUEST, BARNETT.—“A method of making and manufacturing “shoes and boots with soles made of common sole leather “prepared by me for that purpose by a particular process.” The shoes and boots “are to be fastened with spring fastenings “of a peculiar construction, so contrived as to cause them to

"sit better and closer on the foot and leg." The preparation consists of 8 gallons of human urine, and 1 lb. of Guinea pepper or capsicum boiled together for an hour over a slow fire; 2 lbs. of common alum and 4 ounces of sal ammoniac are then added, and the whole is boiled together for 10 minutes. The sole leather is steeped in the solution for 3 days and nights, gradually dried by a slow heat until quite hard, and put on to the shoe or boot with "the flesh side outwards."

In making the shoe, "the horizontal seam which fastens the quarter to the upper leather must be considerably shorter;" and the straps (narrower and shorter than those in common use) "draw in a straight line or direction from the hinder part of the quarter to the buckle." The buckle consists of a "triangular rim," and "two small buckles affixed thereto;" it is secured to the upper leather by studs or pins, which pass through holes made in two pieces of leather, "sewed to the top of the upper leather on each side the centre thereof under the place where the straps usually cross each other."

In boots the seam behind is left "unclosed from the top to within about two inches of the heel." Two pieces of sole leather are sewed to the leather where the seam is left unclosed, and are riveted "to a piece of very thin tin or other metal of about half an inch wide," and "fastened to another thin piece of tin or other metal of about three-quarters of an inch wide, placed on the underside of the first-mentioned piece of tin or other metal and sole leather, by a hinge or fastening." These double pieces of metal "are cut asunder at right angles in several places," and to each division is fixed a snap, spring, or clasp. The pieces of metal are to be covered with thin leather or cloth to prevent "fretting the leg." The legs of the boots may be of other material than leather.

[Printed, 6d. Drawing.]

A.D. 1794, May 17.—No. 1990.

BELL, WILLIAM.—"New invented buckles and shoe fastenings." The "skeleton of the buckle" is a metal plate, rim, or frame. Near to one end is soldered or otherwise fastened "an immovable bar," or "a roller turning upon an axle," or "a loop moveable upon a joint," so as to have a

space between the under side of the plate and the bar. A spike (one or more) is cut out of the end of the plate next the bar, or a spike is soldered thereto; or a spike may be fixed to the bar; in either case the point of the spike is "outwards." A hook or catch (one or more) is cut out from or soldered to the opposite end of the plate; it points inwards, or towards the bar end. The upper side of the plate may be ornamented in any manner.

In using this buckle the outside strap of the shoe is introduced between the plate and the bar. The hook having been pressed into the inside strap, the outside strap is drawn until the shoe is sufficiently tightened, when the end of the strap is raised and pressed against the spike at the bar end; the spike penetrates the strap and secures the buckle in its position.

[Printed, *6d.* Drawing. See Repertory of Arts, vol. 1, p. 149.]

A.D. 1794, September 13.—No. 2011.

ADAMS, BENJAMIN.—"Shoe catches with spring straps, to be "used with buckle rings of every kind." The buckle or "catchet" ring is of metal and made in any convenient manner, "leaving spikes or parts in the bottom thereof to "fasten spikes thereto;" there are usually two spikes at each end inclining downwards, "which take hold of the outside of "the straps, and keep the shoe very tight." Some catchets are made with cross bars, which carry the spikes.

The spring strap is made of any metal or elastic substance and covered with leather; its form depends on that of the catchet. It is made to enter a groove or hollow part in the rim of the catchet, either separate or to be hinged to the catchet or to one of the bars permanently, or by means of a removable pin.

The spring strap is disengaged from the groove "by the "thumb being applied in a reclining position with pressure "on the spring strap."

The spring strap "may be added to and used with buckles "made with chapes and tongues."

[Printed, *6d.* Drawing. See Rolls Chapel Reports, 6th Report, p. 189.]

A.D. 1798, November 15.—No. 2268.

HORNBLOWER, JETHRO.—"A new method of making pat "tens to be worn by women, by altering the composition

"and clumsiness of their make, and preventing their frequent "breaking and uneasiness to the feet." Iron or other metal is substituted for the wooden part to which the rings are riveted. "Thin iron plates, latten or iron dipt in tin," are used, and to prevent bending or giving way under the weight of the bearer a piece of metal is riveted to each end under the bend. The ties are riveted or otherwise fixed to the iron. Sometimes elastic ties are applied made of "metallic substances covered with leather, cloth, &c." To fix the hinder part of the patten, "an elastic string made of brass, wire, or "some other metallic substance covered with leather, cloth, &c." comes round the hinder part of the foot.

[Printed, 4d. No Drawings. See Repertory of Arts, vol. 13, p. 236; Rolls Chapel Reports, 6th Report, p. 194.]

A.D. 1800, May 15.—No. 2402.

MILNER, WILLIAM.—"Women's pattens." The clog or sole portion is made of copper, iron, or other metal. The ties, the ring, the clinch round the sole, and the spur under the sole, are all fastened on by rivets.

These pattens are durable, not liable to split, and light to the wearer.

[Printed, 6d. Drawing. See Rolls Chapel Reports, 6th Report, p. 198.]

A.D. 1801, June 2.—No. 2509.

LONGMORE, JOSIAH.—"A patten or clog." An elastic tongue or spring made of iron or other metal is fixed in an opening in the middle of the block; it presses "against the sole of the foot, thereby keeping it tight against the ties." The block may be of metal, wood, cork, or other material, or of two or more materials united.

[Printed, 4d. No Drawings. See Repertory of Arts, vol. 16, p. 145.]

A.D. 1801, November 3.—No. 2547.

WALKER, JOHN, and ALPHEY, GODFREY.—"Making and "manufacturing caps and hats, and rendering them perfectly "waterproof, as also all kinds of leather, silk, linen, cotton "stuffs, pasteboard, and other manufactures and substances, "for the purpose of being worked up into boots, shoes, gaiters, "women's hats or bonnets, and other wearing apparel, &c. &c.

“to be used on all occasions where a power of repelling wet or moisture may be required.”

The manufacture of caps, hats, and bonnets is described in the first division of the present series.

Leather for boots, shoes, or gaiters is to be dressed without “oil or any other greasy substance;” it is rendered water-proof by coating it both inside and outside one or more times “with any kind of oil, paint, or oil and lampblack, which latter is greatly to be preferred,” and when the coating is dry, by applying thereto one or more coats of japan or varnish mixed with lampblack.

Woven fabrics are rendered fit for use in the manufacture of shoes and gaiters by painting, japanning, or varnishing them on one or both sides as may be found necessary.

[Printed, 4d. No Drawings. See Repertory of Arts, vol. 16, p. 217.]

A.D. 1801, November 28.—No. 2561.

HALL, GEORGE.—“Elastic fastenings for the shoes, and also “for bands, garters, or ornaments for the knees, waist, arms, “neck, and head.” This fastening is a “plate or frame made “with plate or wire or both;” it may be of any size or shape; with or without a cover; “with or without aperture or apertures through the side or sides or ends in any part of frame “or plate;” with the apertures “in any direction, either in “straight lines, bendy lines, or in any curve or angle;” with or without spikes, studs, or bars in any apertures and placed in any “direction that may be chosen.”

The annexed sheet of drawings exhibits several varieties best adapted for narrow straps and bands and several intended for broad straps and bands.

These fastenings are “applicable to all the purposes of “buckles with additional use for narrow bandages or strings “where buckles cannot be applied.”

[Printed, 8d. Drawing.]

A.D. 1805, January 23.—No. 2814.

MOLLERSTEN, CHARLES FREDERIC.—“A chemical composition and method of applying the same in the preparation of “hides, skins, and leather, silks, taffetas, and linen, and to all “articles already made of skins and leather, thereby colouring

“ and giving a beautiful gloss to the same, rendering them
“ waterproof and impenetrable to hot or corroding liquids,
“ and at the same time preserving them from decay, and keep-
“ ing them soft and pliable.” Leather for the uppers of boots
and shoes is coated from four to six times with the following
composition :—Two gallons of linseed oil, one gallon of whale
oil, and half a pound of horse grease, mixed with four pounds
of finely ground Prussian blue, and four pounds of lampblack,
are boiled on a strong fire ; after boiling for half an hour there
is put in half a pound of finely ground benzoin gum mixed with
half a gallon of linseed oil, and a like quantity when the whole
is “ sufficiently boiled and ready.” This gives a composition
for a black colour ; the patentee states the alterations required
for other colours. The composition is to be used in a cold
state.

The leather, stretched and nailed to a board, is coated as
thinly as possible, and is then stove-dried ; it is rubbed with
pumice stone between each coating, and each coating except
the last requires about one hour to dry, the last requiring from
two to three hours. The heat of the stove or oven should not
exceed 60°.

“ All boots must be done, formed, or shaped on blocks ” ;
and “ previous to their being put into the oven, some woollen
“ stuff must be put between the wood and the leather.”

[Printed, 4d. No Drawings. See Repertory of Arts, vol. 7 (*second series*),
p. 168 ; Rolls Chapel Reports, 7th Report, p. 189.]

A.D. 1805, February 19.—No. 2824.

MARTIN, WILLIAM.—“ A new and improved mode of fasten-
“ ing shoes to the feet of men, women, and children.” By
means of this invention “ the heel and toe of the shoe or
“ slipper ” are drawn towards each other (in the operation of
fastening) by a buckle or clasp.

A strap passes on the inside between the upper leather and
the lining of the part “ called the heel quarter ; ” it is fastened
at the heel or round the heel and near the top thereof ; the
ends are drawn through an opening made in the upper leather
on the instep, where they are fastened by a buckle or clasp.
This strap has joined to it two others, one on each side of the
shoe, “ which are carried obliquely down to or near the sole
“ where they are sewed or otherwise fastened.”

Sometimes the ends of the long strap are joined together, "according to the nature of the fastening to be adopted." Sometimes the side straps are omitted.

The invention may be applied with the same effect to the outside of the shoe.

[Printed, 6d. Drawing. See Rolls Chapel Reports, 7th Report, p. 188.]

A.D. 1807, May 11.—No. 3042.

FROME, FRANCIS.—"An improved portable book jack with "a guard to prevent the possibility of any accident to the "legs or ankles in pulling off the boots." The boot jack itself is of the customary form and material, but made in two parts, which are jointed together. The guard "rising over the "joint" is made "with hinges of brass or other metal to "support it and for the purpose of folding up" when not in use; it may be varied in dimensions or shape, may be made of wood or metal, and when in use may stand upright or incline a little backwards.

[Printed, 6d. Drawing. See Rolls Chapel Reports, 7th Report, p. 197.]

A.D. 1808, May 24.—No. 3135.

STEDMAN, JOHN.—"A patten and clog being of infinite "utility and ease to such persons as may wear them." The patentee first describes the clog; it should always be made to fit the shoe. The material used is cork or wood. The clog is made in two parts, a fore part and a hind part, hinged together. The ties (or a toe piece) are fixed to the fore part, and a piece of stiff leather or a thin plate of metal (covered or lined with leather or soft material) about three quarters of an inch high surrounds the hind part. A spring (one or more) is riveted "to the under part" of the hinge, and a piece of thin leather is nailed or screwed along the joint "to prevent "the wet or dirt getting to the springs."

Sometimes a flat spring bent into a curve is fastened at one end to the fore part, and at the other to the hind part.

Some clogs are made in three parts, and a spring hinge is put to each part; sometimes the hinge nearest the toe has not a spring; sometimes the flat spring is "put to join the three "pieces together."

The patten is made by affixing to the fore and the hind part a rim of metal of nearly the shape and size of each part. The rims are nearly filled up with cork.

[Printed, 6d. Drawing. See Repertory of Arts, vol. 13 (second series), p. 370.]

A.D. 1809, February 21.—No. 3207.

RANDOLPH, DAVID MEADE.—(*A communication.*)—"New method of manufacturing all kinds of boots, shoes, and other articles, by means of a substitute for thread made of hemp, flax, or other yarns." This invention consists in fastening the sole and heel of a boot or shoe to the inner sole by means of "little nails, brads, springs, or tacks."

The last employed is covered at the bottom with a plate of metal, and the nails when driven in through the inner sole are clinched by the plate. In order to fix the sole to the last during the operation, the plate is perforated with three holes "of nearly an inch in diameter;" these are filled with wooden plugs to which the sole is nailed.

[Printed, 4d. No Drawings. See Repertory of Arts, vol. 18 (second series), p. 80; Rolls Chapel Reports, 7th Report, p. 203.]

A.D. 1810, August 2.—No. 3369.

BRUNEL, MARC ISAMBARD.—"Machinery for the purpose of making or manufacturing shoes and boots." The soles of these shoes and boots are fastened to the closing by means of metallic pins or nails.

The piece of leather for the sole is pressed between two plates by the aid of a screw and nut and is cut all round with a knife into the shape of the upper plate. "The upper leather or closing" is laid and stretched on a last of cast-iron and held fast thereto by metal clamps. The inner sole is then laid on the last, and the projecting edges of the closing "are flattened down." The outer sole is then placed on the last and pressed down and held fast by a clamp, "and kept steady in its place with a link." A rod moves up and down, being "suspended to the extremity of a short lever," and being struck on the top by a lever which is worked by a treadle. The bottom of the rod carries "a point acting as an awl," so that the same motion which drives in a pin bores a hole "for the reception of the contiguous" pin. The clamp which

holds down the sole "is by about one half of an inch smaller "all round than the sole," and its sides form a guide for the bottom of the rod except at "both extremities of the sole, "which are left to be finished without the assistance of the "clamp."

The bed of the machine "is fixed upon an horizontal slide," which by means of a lever moves the last "from right to left "in order that the rod may work as near as possible under its "perpendicular line;" it has "a circular horizontal motion "upon the slide for the same purpose."

The clamp may have a plate fixed on it; this plate "is cut "all round its edge with as many notches as there are pins to "be driven in," forming "a more complete [guide than the "one before described."

For boots the shank of the last must be long enough to admit the leg, and the clamps must be of a corresponding size.

If the pins used are not of metal, a groove is to be made round the last near its edge; the projecting ends of the pins are to be "seared smooth by means of a hot iron and afterwards hammered in very close and tight." The last is to be made with a removable instep to facilitate the taking off of the shoe or boot.

[Printed, 10d. Drawing. See Rolls Chapel Reports, 8th Report, p. 82.]

A.D. 1810, October 8.—No. 3392.

WOODMAN, RICHARD.—"A new method of manufacturing "all kinds of boots, shoes, and other articles." This method consists "in closing or sewing the upper part of boots and "shoes with hemp in the usual way" or with wire made of any metal, and "in connecting the sole and upper leathers "with screws or staples."

[Printed, 4d. No Drawings. See Repertory of Arts, vol. 18 (*second series*), p. 271; and Roll Chapel Reports, 7th Report, p. 209.]

A.D. 1813, July 7.—No. 3716.

ADAMS, ROBERT.—"A new and improved method of preparing blacking." The ingredients and proportions for 40 gallons of blacking are 40 gallons of (No. 18) vinegar, 90 lbs. of ivory black, 3 gallons of sweet oil, 28 lbs. of raw moist sugar, 18 lbs. of oil of vitriol, and 26 oz. of gum arabic.

The ingredients are to be mixed in "a tub with a tin strainer fixed under its lid or cover nearly of the same size of the lid and full of small holes, and with a hole in the lid sufficiently large to admit the pouring in of the liquid ingredients."

The directions for mixing, &c, are, put the ivory black, the sugar, the oil, and 4 gallons of the vinegar into the tub, and make them into a thin paste. Introduce half the oil of vitriol through the lid and strainer, and after from 5 to 10 minutes pour in through the strainer about 2 gallons of the vinegar. Take off the lid, and gradually pour in the remainder of the vinegar, keeping the whole continually on the stir. Put on the lid, and pour in the remainder of the oil of vitriol through the strainer. Pour the mixture into a copper, put in the gum, and when the mixture begins to boil, "it is fit to be drawn off and when cold to be bottled;" it should be constantly stirred whilst being bottled.

[Printed, 4d. No Drawings. See Repertory of Arts, vol. 25 (second series), p. 135; Rolls Chapel Reports, 8th Report, p. 96.]

A.D. 1816, October 25.—No. 4069.

BOREL, LOUIS FAUCHE.—"A method of making shoes and boots without sewing, so as entirely to keep out the wet, which invention may be applied to other articles in leather." The novelty consists in making the shoe or boot from one piece of leather. The patentee cuts out of a hide a piece of suitable dimensions; he soaks the piece in water, and then "by means of a machine" forms it "into a shoe, boot, or other article, according to the shape and size required." The article is afterwards to "receive its proper colours, shape, and polish" so as "best to produce durability and to give ease and comfort to the wearer."

[Printed, 4d. No Drawings.]

A.D. 1818, April 8.—No. 4244.

BOOTH, WILLIAM.—"A method or process of making by a certain machine or machines wooden clogs for pattens, wooden clogs or soles for shoes, and a description of wooden clogs commonly called or known by the name of the Devonshire clogs."

The machine "used to form the upper side of the clogs or soles" carries a cylinder of wood or other material with "one, two, three, or more plane irons or cutters inserted." The surface of the cylinder and the edges of the cutters are "so curved as to scope or cut out the upper side of the clogs or soles." The wood being cut to the dimensions required is pressed with the side to be operated upon against the surface of the cylinder, and the hollow shape required is produced "by the circular motion" of the cylinder.

The machine "employed to form the under side of the clogs or soles" has "a circular plate or table of wood or other materials" with plane irons or cutters inserted, "being of such a form and size together with the surface of the plate" as may be required for the size of the clogs or soles. The under side of the wood is pressed against the plate and cut thereby to the required shape.

The machine "for forming the outline or shape of the edge" of the clogs or soles is "a double lathe or turning engine." A spindle, its supporting standards, and a plate below them, turn round a centre and are fastened to a frame by clamps and screws. A chuck is screwed on to each end of the spindle for the attachment of a clog or sole, and on the middle of the spindle is fixed a pattern clog or sole made of iron or other material. For cutting the edges there are two spindles, on each of which is fixed a wheel carrying plane irons or cutters; the spindles are mounted on a frame which slides up and down between the frame of the machine; they are so balanced by a weighted lever "as to have as much power to rise as the pressure with which the cutter wheel ought to bear against the clog when at work." Another spindle "with three pulleys and endless band" communicates a very rapid motion to the cutter spindles. The form, size, &c. to which the clog or sole is to be cut is determined by a small wheel or roller attached to the cutter frame and permitting "the frame to rise until the roller touches the edge of the pattern clog."

In working the lathe the workman, when the frame has risen to the proper height, "turns the spindle slowly round" (by aid of a wheel) "until the cutters have traced the clogs or soles to the form and size required." As the wood is usually of a soft nature, it will be necessary to turn the plate "half round upon its centre," whereby the clogs or soles "will be

“reversed,” and the workman will be able “to present that part of the edge to be cut which ought to be so according to the grain of the wood.”

[Printed, *6d.* Drawing. See Rolls Chapel Reports, 8th Report, p. 127.]

A.D. 1818, September 7.—No. 4294.

STUBBS, HENRY.—“A moveable heel for boots, shoes, and other purposes.” This heel is composed of four parts:—(1) a bottom piece of sole leather, (2) a metal hoop, (3) a middle plate of metal, (4) a top plate of metal.

The bottom piece may be bounded or not by a metal rim; it has “a large hole” pierced through it near the back, and six small holes pierced round it.

The hoop is made “with a lip turned at its under edge;” it must be of sufficient depth to allow the middle and top plates to be dropped over it and its upper edge to be turned downwards upon the top plate; it stands on the bottom piece.

The middle plate has “a rim turned up round the whole of its circumference,” a hole to correspond with the hole in the bottom piece, a round aperture for the admission of the hoop, and six small holes for the passage of screws whereby it is fixed to the bottom piece.

The top plate is pierced with an opening for the reception of the hoop and with six holes “so bored that their centers may come exactly over the centers of the large holes” in the bottom and middle parts when the top plate “is turned round for that purpose.”

When the parts are put together, the whole is secured to a boot or shoe by bringing in succession each hole in the top plate over the large hole and screwing a screw into the heel of the boot or shoe. When fixed it will be found that the bottom piece and the middle plate will rotate round the hoop.

[Printed, *6d.* Drawing.]

A.D. 1819, November 1.—No. 4403.

DEACON, WILLIAM ARCHER.—“Improvements in the manufacture of boots, shoes, and clogs by the application of certain materials hitherto unused for that purpose.” The material is whalebone or whalefin; it is applied to form the inner and the outer sole of a boot or shoe. The bones or fins

"are to be sawed across the direction of their fibres into pieces of convenient length for working in the vice."

For the inner sole "merely the hard external shell or skin of the whalebone or whalefin deprived of its soft and fibrous inside" is used. This inside is to be removed "until the remaining part is reduced to about the thirty-second part of an inch in thickness." The shell is then "cut into proper lengths" and blocked and rounded "in the same way as is usual when a cork sole is used." An angular notch is cut in the heel end for the purpose of forming "what is called a seat for the heel of the wearer;" the outer sharp edge of the shell is rubbed off; the shell is then soaked in hot water, after which it is ready to be worked into the boot or shoe.

For the outer sole the whalebone is used "in its entire state, being cut into the required shapes by a fine saw or other convenient tool and made level and finished by rasps or files." The sole should be formed of several pieces laid across the sole, and holes must be drilled round the outer edges to admit the passage of screws, nails, or rivets.

The patentee describes his method of removing the fibrous inside and of making up the bottom of the boots and shoes; he claims however only the use of whalebone or whalefin (deprived of its core) as an inner sole and the use thereof in its natural state as an outer sole.

[Printed, 6d. Drawing. See Repertory of Arts, vol. 38 (second series), p. 276; London Journal (*Newton's*), vol. 1, p. 414.]

A.D. 1819, November 1.—No. 4406.

HUDSON, WILLIAM.—"An improvement in the manufacture of boots and shoes." The thigh of the beast is to be "flayed whole without cutting the skin open from the hock or knee bone of the hind leg as far up the thigh as is required for the height of the boot or shoe." The skin is to be "cut open from the bottom of the thigh or knee bone downward at the hind part and flayed as far as is required for the length of the foot." If the skin is too large at the top, a piece is to be taken out "to be made fit for the person's leg." The fore leg of the beast is to be "flayed whole for the boot tops to any length required;" or it may be flayed in the same manner as the hind one, and the skin be applied to the

same use. For half-boots or shoes "the skins may be flayed whole below the thigh or knee instead of above."

The skins are to be tanned, and dressed or curried, in the usual manner, and to be afterwards blocked into shape.

[Printed, 4d. No Drawing. See London Journal (*Newton's*), vol. 1, p. 22; Rolls Chapel Reports, 8th Report, p. 133.]

A.D. 1822, March 2.—No. 4652.

BUCKLE, JOHN WILLIAM.—(*A communication from John Parker Boyd.*)—"Improvements in machinery for shaping or cutting out irregular forms in wood or any other materials or substances which admit of being cut by cutters or tools revolving with a circular motion, whether such motion be continuous or reciprocating." The machinery described is supposed to be "in the operation of shaping or cutting out a shoe last."

A hanging lathe is pivoted to two short pieces of wood, which are mortised into the lower side of the cross framing. The lower part of the lathe is divided into two equal compartments by a cross rail forming two square or oblong frames, one containing the pattern last, the other adapted to receive the block which is to be cut into a last. Two iron rails fixed to the frame of the machine serve as guides for a carriage to move on in a direction parallel to the axis of the pattern last and the block. The carriage has mounted on it three standards which support the axles of the cutter wheel and of a friction roller, the periphery of which is always in contact with some part of the surface of the pattern. The cutter wheel "consists of a circular plate of metal having small cutters or knives of a hooked shaped fixed against its surface, and projecting beyond the circumference of the circular plate to such a distance as to correspond exactly with the circumference of the friction roller." The lathe is provided with a weighted arm projecting backwards and tending to press it towards the front of the machine and keep the surface of the pattern in close contact with the roller.

The inventor describes very fully the arrangement of the various parts, the requisite gearing, and the operation of the machine.

He also describes at length a machine differing from the foregoing in many of its arrangements, but acting "upon a

"similar principle." In this two lasts may be cut out at the same time, having only one pattern mounted between the blocks. Moreover, one of the two may be "adapted to the form of the right foot, and the other to the left foot," the pattern being shaped "either for the right or left foot indifferently."

[Printed, 1s. 4d. Drawings. See London Journal (*Newton's*), vol. 5, p. 238.]

A.D. 1823, March 18.—No. 4766.

ROGERS, THOMAS.—"An improvement on stays or bodices, "which improvement is also applicable to boots." The improvement consists in inserting eyelets into the laceholes. The instruments used, and the method adopted by the patentee, for the insertion of eyelets into stays are described in the second division of this series.

Eyelets for boots are of smaller size than those used for stays. Small holes are punched in the leather, and the eyelets are pressed into the holes, "the leather expanding to the pressure "and again contracting." The patentee does not inform us if he flattens the eyelets after insertion; but for stays he uses an instrument which he calls "a tucker-in"; by aid of this the edge of the nick made in the fabric is "tucked or closed in "under the projecting rim of the eyelet."

In cloth boots holes are made "with a sharp pointed round "instrument"; holes should not be cut out; the eyelets are pressed into the holes.

[Printed, 6d. Drawing. See London Journal (*Newton's*), vol. 7, p. 25.]

A.D. 1823, December 27.—No. 4883.

GREENWOOD, THOMAS, and THACKRAH, JOSEPH.—"Improvements on or substitutes for pattens and clogs." These articles are made "with soles of leather, whalebone, "horn, hard, rolled, or hammered metal, or any other elastic "substance or substances combined."

The patten shewn in the annexed sheet of drawings has a sole of thick leather with a thin elastic plate of steel "about "the substance of a saw blade" riveted to its under side; there are three rivets near each end, "leaving the small or "middle part at liberty." Before the plate is riveted to the sole, it is perforated with holes necessary for the attachment of the rings or irons, ties, heel-piece, &c.

The sole of the clog is similar to that of the patten, the plate being previously perforated with the holes required for attaching the wooden blocks, ties, heel-piece, &c.

Other materials may be used to form an elastic sole.

[Printed, *6d.* Drawing. See London Journal (*Newton's*), vol. 7, p. 177.]

A.D. 1824, February 28.—No. 4908.

GUNBY, JOHN.—“A process by which a certain material is prepared and rendered a suitable substitute for leather.” The patentee applies his invention (*inter alia*) to “such articles as require a pliable quality for the manufacture of ties for women’s pattens.”

He coats (so as to thoroughly saturate) woven or felted fabric with a composition made in the following manner:—Glue size (about 1 part) melted at a moderate heat is mixed with fat boiled linseed oil (about 4 parts); when “completely blended,” lampblack (about $\frac{1}{2}$ part), white lead (about 1 part), pipe clay (about 1 part), and litharge (about 2 parts) are added. When all the ingredients are melted, the whole is allowed to simmer for half an hour or more, and is then ready for application.

The fabric requires three or four coats; each coat should be as thin as possible and be dried gradually. The coated fabric is then fit to be cut “into stripes of a proper breadth for patten ties.”

If the surface of the coated fabric is not sufficiently smooth, pressure between plates is applied. Oil or varnish may be used to give the surface “a japanned appearance;” and the ties may be “finished in dies under a press or stamp.”

[Printed, *4d.* No Drawings. See Repertory of Arts, vol. 2 (*third series*), p. 217; London Journal (*Newton's*), vol. 8, p. 179; Register of Arts and Sciences, vol. 2, p. 68; Engineers’ and Mechanics’ Encyclopedia, vol. 2, p. 75.]

A.D. 1824, March 20.—No. 4923.

PETITPIERRE, JEAN HENRY.—Machine for making from one piece of leather, and without any seam or sewing, all kinds of shoes, gloves, caps, hats, cartouche boxes, and scabbards and sheaths for swords, bayonets, and knives. The manufacture of caps, hats, and gloves will be found in other divisions of this series.

To make a shoe, a piece of sole leather soaked in water is cut into a shape shown in one of the figures in the sheet of drawings. "A shallow groove" is ploughed across the leather at or near the waist; for this purpose the leather is "laid with" its smooth face upwards; a "double edged tool" is drawn across it "so as to cut two linear incisions across it of a proper depth, or equal to the intended thickness of the upper leather," and another tool then ploughs away the leather between the incisions. The pattern for the sole is laid on and secured from slipping out of its place by two spikes or points. The leather with the sole pattern on it is placed on an adjustable table of the machine (the pattern upwards) and held in position by clamps. "One of the side incisions" is now made in the leather, "so as to leave it of twice the thickness of the upper leather of the intended shoe." The leather is now turned half-way round, and the other side incision is made. "The heel and toe are not cut at all." The sole pattern is now removed, and the leather "is bent across a right angle in the line of the plough groove" by placing it in the jaws of a vice and beating it down with a mallet. The leather thus bent is then "slit internally towards the toe and heel," for which purpose two cutters are required; the second "enters the leather only half the depth of the former one, leaving it above of the thickness of the upper leather of the intended shoe, and consequently it divides the leather before cut on each side of it through its thickness;" the heel part is then slit. The next process is to remove the excess of leather on each side of the sole; this is effected by turning the leather upwards, placing the pattern in contact with it, putting both under the screw of a press and "employing right and left hooked cutters." The shoe is now again soaked in water and put upon a last; the bands on each side are carefully pared and hammered down upon the last; and finally, when the shoe is sufficiently dry, "it must be finished in the usual manner of currying and dressing leather."

The machine, comprising an adjustable bed, a cast-iron stock, cutters fixed to the stock, guards and guides of different forms, adjusting screws and gauges, is fully described in the specification.

[Printed, *8d.* Drawing. See Repertory of Arts, vol. 1 (*third series*), p. 64; London Journal (*Newton's*), vol. 9, p. 344; Rolls Chapel Reports, 7th Report, p. 124.]

A.D. 1824, May 31.—No. 4965.

HOLLAND, JAMES.—“Improvements in the manufacture of “boots and shoes.” The sole and heel or bottom part of these articles consists of three pieces of wood united (by preference) by knuckle joints; sometimes of three pieces of wood and “two pieces of leather” called by the patentee the “waist or shank piece” and joined to the wooden pieces “by means of screws or nails or both.” Any light wood “not liable to crack or shake” may be used, but the patentee recommends “lime-tree wood boiled in lime water and afterwards in oil and put to season until perfectly dry.” The heel piece “should be an extra thickness for a boot;” the sole piece may be of the same thickness for a boot as for a shoe; the thickness for light boots and shoes “need not be more than $\frac{5}{8}$ ths of an inch.” The joints are oblique and parallel, and rules are given “for settling the exact degree of obliquity of the joints when a particular foot is to be fitted.” The pieces are to be hollowed out “so as exactly to fit the “bottom or sole of the last” and be “shaped to suit the “form of it.” “Feathered, sunk, or moulded edges” must be made “round the toe piece” and a “sunk, or quirk and rebated edging round the heel piece.”

Directions for the workman :—Put on the inside face of the sole a covering of leather, cloth, &c., and cement it on with paste. “Fit a piece of tar cloth over all the reduced part on “the under side.” Tack the sole on to the last and “last “on the upper leather and make it fit closely” upon the feathered edge, and “into the quirk rebates or sinkings round “the heel piece so that the edges of the upper leather shall “fit home to the raised parts of the sole and heel.” Fasten and secure the upper leather round the heel with a welt and “nails proper for the purpose.” Secure the upper leather round the toe piece with screws, nails, and a suitable welt. “Completely cover the whole of the reduced part” of the sole with a piece of leather “of sufficient substance to finish “in continuation and be level with the welt.” “Secure by “channel-sewing the edges of the waist and by means also “of nails and screws.” Pare and finish in the customary manner.

[Printed, 10d. Drawing. See London Journal (*Newton's*), vol. 9, p. 186; Register of Arts and Sciences, vol. 2, p. 228.]

A.D. 1824, November 29.—No. 5045.

HANCOCK, THOMAS.—“A method of making or manufacturing an article which may be in many instances substituted for leather and be applied to various other useful purposes.” This substitute, which may be used for the manufacture of boots and shoes as well as a variety of articles heretofore made of leather, consists of fibres of flax, hemp, cotton, wool, hair, &c, saturated “with a liquid, which when partially evaporated becomes a flexible and adhesive substance.” The liquid or juice is obtained in South America “from a tree called ‘Hevaea;’” when exposed to the air in the sun or in a warm room, it “becomes inspissated” and then forms a substance resembling caoutchouc; “its colour and consistence very much resemble cream.”

Such fibres as are capable of being carded are passed through a carding machine, and such as are capable of being felted are felted, the object being “to obtain a layer of fibres of uniform thickness.” The layers (according to the thickness required) are spread layer upon layer on a flat board or plate; they are sprinkled with by preference warm water until all are uniformly wetted; the superfluous water is expelled by pressure between two boards or plates in a press, and the mass is then ready for saturation with the liquid. The superfluous liquid being expelled by pressure with a wooden roller, the compound is put into a room heated to from 80° to 90° Fahr. and left there until it is nearly dry. Strong pressure is then applied; and if the compound is to have a smooth surface, it is to be pressed between polished plates. If “colour is not an object,” the liquid requires only to be strained before use; otherwise the colour must be got rid of, and the patentee describes the process which he adopts. The degree of pressure after the saturation depends on the stiffness and solidity required in the substitute; the softer kinds require a greater degree of pressure “so as to drive out a greater proportion of the liquid.” In some cases the liquid is mixed with about one-fourth of its bulk of water.

[Printed, 4d. No Drawings. See Repertory of Arts, vol. 2 (*third series*), p. 281; London Journal (*Newton's*), vol. 10, p. 22; Engineers' and Mechanics' Encyclopaedia, vol. 2, p. 76; Webster's Reports, vol. 1, p. 582 (*note*).]

A.D. 1825, March 15.—No. 5120.

HANCOCK, THOMAS.—“A new or improved manufacture, “ which may in many instances be used as a substitute for “ leather and otherwise.” The patentee mentions “soles for “ shoes and boots” among the articles which may be made from this substitute for leather.

The substitute consists of one or more layers, each composed of two pieces of cotton cloth, coated with either of the compositions described below, and having between the pieces “ wool, “ cotton, hair, silk, flax, hemp, carded, combed, or hackled,” the whole being consolidated by pressure, and each layer being united with composition. If it is wished “to have the “ carded cotton for either or both surfaces,” the outside piece or pieces of the cloth can be stripped off during the manufacture. For the soles of shoes and boots, the patentee prefers “ wove hair and cotton in about equal proportions” as the wadding between the pieces of cloth.

One composition consists of a mixture of 2 lbs. of caoutchouc dissolved in 1 gallon of equal parts of turpentine and highly rectified coal tar oil, 6 oz. of black resin, 2 lbs. of strong glue size, and 1 lb. of ochre, ground pumice, or whiting.

The other consists of 1½ lbs. of caoutchouc dissolved as before, and 1 lb. of strong glue size.

The first composition “is applicable to article where stiffness “ and cheapness are required,” the second “where pliancy “ and strength are more required,” and for articles “much “ exposed to the weather.” The proportions of each may be varied.

[Printed, *Ad.* No Drawings. See Repertory of Arts, vol. 3 (*third series*), p. 129; London Journal (*Newton's*), vol. 11, p. 310; Engineers' and Mechanics' Encyclopædia, vol. 2, p. 76.]

A.D. 1826, May 6.—No. 5360.

SCHALLER, JOSEPH.—“Improvements in the construction “ or manufacture of clogs and pattens or substitutes for the “ same.” These are made in such manner that they may be lengthened or shortened, that the heels may be widened or narrowed, and that the slide affixed to one side may yield so as to lengthen or shorten the strap across the instep.

“The methods by which a clog or patten may be lengthened “ or shortened, or the heel narrowed or widened, are very

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"numerous." That first described by the patentee consists in introducing into the waist of the clog "a sliding rack and "spring," and into the heel "another rack and spring, or a "screw or other contrivance, which allows the sides of the "heel piece to be contracted or expanded breadthwise."

The slide is composed of two plates "laid flatwise in contact "with one another;" each is pierced with long slots in which pins slide. Two of the pins are "fixed to each plate and connect the opposite plate by their heads projecting over it." Increased friction is given to the sliding plates, and their action is stopped, by means of a spring fixed to one plate and carrying a catch which enters a hole in the other plate.

[Printed, 8d. Drawing. See Repertory of Arts, vol. 4 (*third series*), p. 327; London Journal (*Newton's*), vol. 14, p. 315; Register of Arts and Sciences, vol. 4, p. 409; Engineers' and Mechanics' Encyclopædia, vol. 1, p. 371.]

A.D. 1826, October 4.—No. 5414.

HALLIDAY, FRANCIS.—"Improvements on apparatus used "in drawing boots on and off." The patentee describes boot-hooks and a boot-jack which are "more portable" than those now in use and capable of being "packed in a smaller "compass."

Boot-hooks:—The upper portion of the stem is grooved through; the handle is united to the upper end of the stem by a joint-pin which passes through the groove and slides therein "so as to admit of shortening the length of the instrument" for packing. When folded up the boot-hooks are laid with their handles parallel to the stems and towards each other and extending "but a very little or not at all beyond "the end" of the stems. The boot-hooks are held together when packed up by small pins in the handles entering corresponding holes in the stems. On one end of one handle is fixed a punch, on the other end a screw driver; at one end of the other handle a notch is cut to receive the screw driver; at the other end is a button-hook.

Boot-jacks:—This instrument is formed of two steel bars united at one end by a joint. Each bar has a joint in the middle of its length, a short length to raise the free ends of the bars, and "a short stump" to form "firm supports for "them to rest upon." The free ends are united by links which are jointed to the bars and "united together by a joint

“and pin.” When the bars are folded together, the links enter “cavities made in the adjacent sides of the bars;” the legs “are folded down upon their joints” and lie flat against the under side of the bars; the stumps enter cavities “in the opposite half of the bars;” and a steady pin fixed in one of the bars enters a hole in the other.

[Printed, 8d. Drawing. See Repertory of Arts, vol. 5 (*third series*), p. 252, also vol. 6 (*third series*), p. 72; London Journal (*Newton's*), vol. 1 (*second series*), p. 350.]

A.D. 1826, December 22.—No. 5442.

MORRISON, THOMAS.—“Process of rendering boots, shoes, “and other articles waterproof.”

[No Specification enrolled.]

A.D. 1828, May 13.—No. 5653.

JACKSON, THOMAS.—“A new metal stud to be applied to “boots, shoes, and other the like articles of manufacture.” This stud is made by preference of steel; it consists of two parts called by the patentee “the wearing end” and “the “holding end.” The sides of the wearing end are bouged. When the stud is to be applied to a boot or shoe, a hole should be countersunk in the leather “of the diameter only of the “upper part or surface of the wearing end” and “of the “exact depth of the said wearing end;” the holding end is to force its way in by the force applied. The bouged part will force open the hole whilst the stud is being driven in, and the leather “being elastic will close in upon the upper part of the “wearing end” and assist in holding the stud in place.

The shape of the wearing end may be varied.

[Printed, 4d. Woodcuts. See London Journal (*Newton's*), vol. 7, p. 83; Mechanics' Magazine, vol. 11, p. 426, and vol. 12, pp. 59, 191, 255, 288, 448, 464.]

A.D. 1828, June 17.—No. 5666.

BARTLETT, JOHN.—“New and improved method or methods “or manufacturing process for preparing flax thread or yarn “for use in the manufacture of boots, shoes, saddlery, and “of sail and other cloths or bagging.” The patentee renders flax thread or yarn “more durable and less liable to rot or “decay by exposure to alternate wet and dry” by means of the following process, which he calls “the tanning principle.”

He steeps or boils the thread or yarn in a decoction or infusion of oak bark or other substance "which contains the "real tanning principle." The thread or yarn when dried "becomes fit for use." Sometimes "the operation must be "repeated, drying the flax, thread, or yarn each time."

[Printed, 4d. No Drawings. See Repertory of Arts, vol. 8 (*third series*), p. 479; London Journal (*Newton's*), vol. 6 (*second series*), p. 94.]

A.D. 1829, March 10.—No. 5775.

HALL, RICHARD.—"A composition applicable to certain "fabrics or substances from which may be manufactured "boots, shoes, and various other articles." The proportions and ingredients of the composition are 1 lb. of beeswax, 8 ounces of india-rubber or gum, 4 ounces of resin, 8 ounces of ivory black, and 4 ounces of lamp black; these are dissolved together either by boiling or by gradual heat, "until the composition becomes very nearly as fluid as water." The proportions may be varied; some ingredients may be omitted, or other substituted for them; pulverized materials of various colours may be used instead of the ivory and lamp black; the india-rubber cannot be omitted.

Mode of application:—A piece of cloth is laid on a metal plate which forms the top of a close boiler. The boiler contains water to about $\frac{3}{4}$ of its height; the water boiling heats the plate; the composition rendered fluid by heat is applied to the cloth and rubbed well in so that the cloth may be saturated therewith; the cloth is exposed to the air for a few days and is then laid on a smooth surface and sleeked to give it a fine face; calendering will have the same effect. Sometimes the prepared cloth has a solution of india-rubber applied to its back.

[Printed, 4d. No Drawings. See Repertory of Arts, vol. 8 (*third series*), p. 672; London Journal (*Newton's*), vol. 4 (*second series*), p. 288; Register of Arts and Sciences, vol. 4 (*new series*), p. 65.]

A.D. 1829, June 13.—No. 5801.

PORTER, ROBERT.—"Improvements in the manufacture of "iron heels and tips for boots and shoes." This invention applies to such heels and tips as are formed by the action of grooved rollers.

The first improvement consists in causing the heels and tips "to be thickened in those parts which are most exposed to

"wear," and to be thinned in those which are less exposed; this is effected by thickening and thinning the proper parts of the iron whilst it is straight or before bending it.

The second improvement consists in indenting the iron whilst being bent round the rollers with depressions marking the places where holes are to be made in the heels and tips; this is done by means of solid and projecting parts fixed in the grooved rollers; the projections "may in some cases entirely perforate the said heels and tips."

[Printed, 10d. Drawing. See Repertory of Arts, vol. 9 (*third series*), p. 97; Register of Arts and Sciences, vol. 4 (*new series*), p. 30.]

A.D. 1831, September 27.—No. 6170.

MYATT, JOHN.—"An article to be worn on the feet as a substitute for pattens or clogs, which I denominate Myatt's health preservers." The sole is made in two parts joined by a bar, which is acted upon by a coiled spring in such manner that the sole is elongated while the patten or clog is being put on and shortened when put on. The sole is provided with a covering for the toes and with a shield for the heel. A ring is secured to the hinder part of the sole. The ring under the front part of the sole turns on a pin "in order to give it motion to accord with the tread," and a spring fastened to the under part of the sole rests upon the front of the ring "and offers an elastic resistance to the front of the ring," thereby preventing any jarring when walking.

The sole of the clog is made in like manner; the heel and sole "are made thicker," and there are no rings.

[Printed, 6d. Drawing. See London Journal (*Newton's*), vol. 3 (*conjoined series*), p. 91; Register of Arts and Sciences, vol. 6 (*new series*), p. 303.]

A.D. 1832, October 22.—No. 6323.

STOCKER, ALEXANDER, and STOCKER, WILLIAM SOUTHWOOD.—"Improvements in machinery for manufacturing iron and other metal tips for the heels and toes of shoes, chain links, and other articles." A vertical hollow axle passes through the top of a frame; it carries a horizontal wheel and disc. The disc carries a circular bed, and the bed a templet for giving the required shape to the article; "the surface of the bed" is made "convex, concave, or of such other form

"as may contribute to give the desired shape" to the articles. A shaft, passing through the templet and the hollow axle, is secured by a nut at the top and "is held down in its place by a weight hung to the lower end thereof." A piece of metal or other material is "attached to the wheel and disc," and a guide carrying a roller is screwed (after being properly adjusted by screw and nut) to the piece. Motion is communicated to the wheel and disc by means of an axle whereon are mounted a pinion and a pulley carrying a band. The templet is raised when required by a lever which acts on the shaft, and the long arm of the lever is depressed by "a vertical shaft with a friction roller at its upper end and a strong projecting pin conveniently situated on the shaft;" the vertical shaft is depressed by "a strong piece projecting from the wheel and disc."

The material for making the tip is cut into lengths; one end of each length is confined by a staple and a stop; the machine is put into motion, and the roller presses the length into shape against the templet and the bed. "The edge of the roller" is so shaped as to "contribute most effectively to the formation of any articles."

Disclaimers.—On the 26th July 1836, Richard Southall the younger entered a disclaimer against "all the parts separately of which the said machine is composed," declaring that "the invention relates only to the mode of combining and applying to the other parts of the machine the various parts as described in the specification in the following words:—"A strong fulcrum attached to the frame;" "a lever moving on the fulcrum," "serving to raise (when required) the templet or mould" "from the bed or platform;" "a vertical shaft with a friction roller at its upper end and a strong projecting pin (conveniently situated) on the shaft for depressing the long end of the lever," "and thereby raising the templet or mould;" "a strong piece projecting from the wheel and disc, which serves to depress the shaft," "and thereby raise the templet or mould" "at a convenient point in each revolution of the wheel or disc." He further disclaimed any novelty in making the bed convex or concave or of such other form as may contribute to give the desired shape. Having advertized his disclaimers (as directed) in three newspapers and no opposition having been made, he obtained leave

to file his disclaimers, and they were stamped and enrolled on the 16th August 1836.

[Printed, *8d.* Drawing. See Repertory of Arts, vol. 15 (*third series*), p. 327; and vol. 2 (*new series*), p. 74; London Journal (*Newton's*), vol. 7 (*conjoined series*), p. 163, and vol. 21 (*conjoined series*), p. 475 for disclaimer.]

A.D. 1834, June 17.—No. 6630.

JECKS, ISAAC, junior.—"An apparatus or machine for putting "or drawing on or off boots." The apparatus consists principally of a base plate and standards (usually three in number) fixed thereon. The outer standards are made with a series of hooks or racks on their inner side, the middle one with corresponding hooks or racks on each side. Each outer standard carries near the bottom a projection similar to a boot-jack and serving the purpose of one, and at the top a socket for the reception of a rod. The rod slides in the socket, its height being regulated by a pin; at its top is a handle.

The boot is suspended by its loops on the hooks most convenient in height; the foot is inserted; the person takes hold of the handles, and "the body will be in the most advantageous "position for exerting force without inconvenience."

An apparatus for hotels and the like is made with a greater number of standards.

[Printed, *6d.* Drawing. See Repertory of Arts, vol. 4 (*new series*), p. 273; London Journal (*Newton's*), vol. 7 (*conjoined series*), p. 200; Mechanics Magazine, vol. 23, p. 254.]

A.D. 1835, August 22.—No. 6888.

JOHNSON, WILLIAM.—"Improvements in the construction "of boots and shoes." The improvements are intended to afford convenient means of "attaching and detaching the "tension straps of trousers and gaiters." Three methods are described,

1. A tube is formed through the narrow part of the sole for the passage of a strap or chain, or for the reception of spring catches attached to the trousers or gaiters.

2. Metal studs or bars are affixed to the edges of the sole for the purpose of holding down the trousers or gaiters by means of hooks, loops, or clasps.

3. Metal plates are fastened to the sole, or a plate is passed under or through the sole; the projecting ends are "bent

"upwards, with slots, openings, or sockets for the reception
 "of spring catches, clasps, or studs attached to the trousers
 "or gaiters."

[Printed, *ed.* Drawing. See London Journal (*Newton's*), vol. 8 (*conjoined series*), p. 399; Rolls Chapel Reports, 7th Report, p. 165.]

A.D. 1836, December 3.—No. 7246.

BRYANT, WILLIAM, and JAMES, EDWARD.—"Improvements
 "in the manufacture of liquid and paste blacking." Liquid
 blacking is composed of india-rubber oil (about 18 oz. dissolved
 by heat in 9 lbs. of rape oil), 60 lbs. of fine ivory black, 45 lbs.
 of molasses, 1 lb. of gum arabic finely powdered and dissolved
 in vinegar, 20 gallons of vinegar (No. 24), 12 lbs. of sulphuric
 acid, and 3 lbs. of finely powdered gum arabic. Mix and
 grind the ingredients (except the sulphuric acid and the 3 lbs.
 of gum) until perfectly smooth; then add the acid "in small
 "quantities at a time," stirring briskly for half an hour. Stir
 the mixture for half an hour daily for 14 days; put in the
 3 lbs. of gum, repeat the stirring for half an hour daily during
 the following 14 days, and the blacking will be fit for use.

Paste blacking is composed of india-rubber oil (as before),
 the before-named quantities of ivory black, molasses, and sul-
 phuric acid, and gum arabic (quantity not stated), finely pow-
 dered and dissolved in 12 lbs. of vinegar (No. 24). Mix and
 grind the ingredients (except the acid) until perfectly smooth;
 add the acid in small quantities at a time; stir briskly whilst
 adding the acid, and "for half an hour after the whole is
 "mixed;" in 7 days the blacking will be fit for use.

[Printed, *4d.* No Drawings. See Repertory of Arts, vol. 7 (*new series*),
 p. 266; London Journal (*Newton's*), vol. 11 (*conjoined series*), p. 91.]

A.D. 1837, December 2.—No. 7493.

DOWIE, JAMES.—"Improvements in the construction of boots
 "and shoes, and other covering for the human foot." The
 improvements consist in rendering boots, shoes, slippers, clogs,
 and goloshes "elastic or yielding in the middle part thereof,
 "or between the fore and hind quarters," thereby "allowing
 "freedom to the natural action of the joints of the foot in
 "stepping."

The patentee effects his object by the insertion of an elastic
 substance between the heel and the fore part of the sole, "in

“ that part which is immediately under the elastic arch of the “ foot,” and by the insertion of elastic gores or gussets in the sides of the upper leather or quarters. These gores or gussets extend “lengthwise with the elastic part of the sole, and in “ height near to the ankle in boots, and to the top of the “ hind quarters in shoes.” The elastic pieces “ may be of “ various forms,” and the material may be india-rubber or a combination of india-rubber and leather or cloth or woven fabric.

The patentee prefers for his elastic material a combination of india-rubber and leather prepared in the following manner :—After the tanning and the shaving, but before the application of oil or other greasy matters, the leather is shortened by compressing or crimping. A thin sheet of india-rubber is then cemented on with a thin solution, and the surface of the leather is afterwards dressed and finished in the usual manner.

The annexed sheet of drawings shows several of the improved boots and shoes, but the patentee does not confine himself to any of “ the precise forms ” shown. He describes also “ one “ of the modes ” which he adopts in manufacturing.

[Printed, 10d. Drawing. See London Journal (*Newton's*), vol. 12 (*conjoined series*), p. 330; *Mechanics' Magazine*, vol. 31, p. 271.]

A.D. 1838, July 11.—No. 7731.

BETHELL, JOHN.—“ Improvements in rendering wood, cork, “ leather, woven and felted fabrics, ropes and cordage, stone “ and plasters or compositions, either more durable, less pervious to water, or less inflammable, as may be required for “ various useful purposes.” The mixtures or solutions used are divided into three classes; the first contains such as will render the above-named articles or some of them “ more “ durable;” the second such as will render them “ more durable and less pervious to water;” the third such as will render them less inflammable.

The mixtures or solutions are pressed or forced into the articles “ by means of pneumatic or hydrostatic pressure.” The patentee describes (but does not claim) “ the form of apparatus ” which he prefers to use.

Boots and shoes “ may be rendered less pervious to water ” by impregnating them after they are made (and likewise

leather) with either of the following mixtures or solutions of the second class :—(1) Boiled or drying linseed oil mixed with oil or spirits of turpentine, with or without $\frac{1}{2}$ lb. of caoutchouc paste to each gallon of linseed oil ; (2) Caoutchouc paste mixed with rape oil in like proportion to (1) ; (3) Solutions of caoutchouc in spirits of naphtha or turpentine or other spirit ; (4) Beeswax dissolved in spirits of turpentine, in about the proportion of 1 lb. of wax to 1 gallon of spirits.

[Printed, 6d. No Drawings. See Repertory of Arts, vol. 16 (*new series*), p. 356; London Journal (*Newton's*), vol. 20 (*conjoined series*), p. 111; Mechanics' Magazine, vol. 31, p. 302.]

A.D. 1839, January 11.—No. 7928.

POOLE, MOSES.—(*A communication.*)—"Improvements in "clogs." These clogs cover only a part of the boot or shoe, namely, the heel and a portion of the sole.

The shield of the clog is of the ordinary construction, but the sole is shortened and connected to the heel part by an "elastic coupling." The coupling consists of a bent wire which is hinged to the sole and a metal plate. The plate is pierced with a slot for attachment to the sole of the boot or shoe, "there being a screw or other suitable attachment in the "sole of the same." The plate "is bent over in order partly "to cover the wire," and round the wire is a coiled spring. There are holes in the plate through which the wire passes ; consequently "when the plate is drawn back and held by the "screw, the spring will be condensed" and will cause the sole of the clog "to be securely held to the sole of the boot or "shoe, notwithstanding the movement produced in the act of "walking."

The inventor does not limit himself "to the use of the connecting means" above-described, as they "may be varied," provided that they "allow of the necessary freedom or elasticity and bending of the sole of the clog and of the boot or "shoe in the act of walking."

[Printed, 6d. Drawing. See Repertory of Arts, vol. 12 (*new series*), p. 217.]

A.D. 1839, July 20.—No. 8162.

STOCKER, ALEXANDER SOUTHWOOD, and JOHNSON, THOMAS.—"Improvements in machinery for manufacturing shoe heel

“ and toe tips.” This invention relates to the manufacture of “ what is denominated solid backed iron shoe tips.”

The first improvement consists “ in effecting a more gradual change from the square bar to the true tip form ” :—This is done either by using “ a distinct pair of preparing rolls containing only leading or preparing grooves,” or by making leading grooves in the rolls ordinarily in use and passing the iron through them before the finishing grooves are employed.

The next improvement consists in giving to the rolls such a form “ as will have the effect of tightening or reducing the weight of the metal, and at the same time preserve its apparent size or fulness ” :—The upper side of the solid part of tips is hollowed out by providing the upper roll with a series of projecting pieces, “ which as they roll round imbed themselves in the solid parts of the tip-iron, and thereby make hollows or depressions therein.”

The third and last improvement consists in the apparatus for bending the bars into the desired shape with great accuracy :—The parts which the patentees claim are (1) an adjusting screw between the connecting rod and the sliding bar ; (2) a pinion keyed on to the shaft, whose upper end supports the bar to be bent ; and (3) a rack on the sliding bar and working into the pinion. The adjusting screw “ will act conveniently according to the workman’s desire ” ; it is stated by the patentees to be “ an important mechanical part of the invention.”

[Printed, 1s. Drawings. See *Inventors’ Advocate*, vol. 2, p. 133.]

A.D. 1839, October 17.—No. 8241.

MORRICE, ROBERT EDWARD.—(*A communication.*)—“ Improvements in the manufacture of boots and shoes and coverings for the legs.” The inner sole is placed on the last, and on the inner sole “ a plate of metal or cork or dissolved india-rubber,” or other material which will keep out wet. The upper leather is pierced around with two rows of holes, one for the passage of screws, the other (near the edge) for the passage of a thin cord ; when it is placed on the last, it is laced tightly on ; the cord is then hammered flat, and the outer sole is screwed on to the upper.

The invention is applicable to all leg coverings which are made with soles.

[Printed, 6d. Drawing. See *Repertory of Arts*, vol. 14 (*new series*), p. 15 ; *Inventors’ Advocate*, vol. 2, p. 200.]

A.D. 1840, March 7.—No. 8416.

COX, CAROLINE JULIA SOPHIA.—“An improved mode of fastening and uniting the edges of the divided parts of shoes, boots, bandages, packages, and other articles of dress or utility.” Rows of holes to receive a cord or lace are made “through the double thicknesses of folded edges.” The edges “are cut across opposite to each such hole from the said hole to the outside of the folded edge.” A thin strip of whalebone or other suitable material is inserted into “the hollow of the fold of each folded edge,” so that when the edges are united by lacing, the whalebone bears the strain. The edges may be unfastened by withdrawing the strips, thereby avoiding “the trouble of unlacing.”

[Printed, 10*l*. Drawing. See *Inventors' Advocate*, vol. 2, p. 307.]

A.D. 1840, March 23.—No. 8441.

KEENE, CHARLES.—(*A communication.*)—“Improvements in producing surfaces on leather and fabrics.” The object of this invention is to produce on leather (to be used for boots, shoes, and other articles) a surface which shall be waterproof, or partly waterproof, elastic and pliant, and not liable to chip or crack.

Caoutchouc (about 100 lbs.) cut into small pieces or bruised into thin sheets is soaked for about 24 hours in about 200 lbs. of turpentine or other solvent; it is then passed several times between rollers, and during the process lampblack or other colouring matter is sifted on to it sufficient to give it the required colour; after this it is worked “to the consistency or thereabouts of stout dough or putty,” and kept in water ready for use.

A skin of leather (by preference “doeskin, buckskin, wash-leather, and the like”) and a quantity of the compound sufficient to cover the skin are pressed together and securely united by means of a pair of rollers, of which the one facing the compound is supplied with a damper of water so that it may be kept constantly wetted whilst the rolling is going on. The coated surface when dry may be finished off with two or more layers of varnish “to give it a gloss and remove the adhesive properties.”

[Printed, 4*l*. No Drawings. See *Repertory of Arts*, vol. 14 (*new series*) p. 233; *London Journal (Newton's)* vol. 23 (*conjoined series*), p. 357 *Mechanics' Magazine*, vol. 35, p. 397; *Inventors' Advocate*, vol. 3, p. 238.]

A.D. 1841, April 27.—No. 8938.

STOCKER, ALEXANDER SOUTHWOOD, and HEELEY, CLEMENT. —“Improvements in patten and clog ties, and other articles “ or fastenings of dress.” The patentees make their patten and clog ties from thin metal plate (preferring steel); they cut the metal into the required shape, perforate it for the strings and for the nails, and cover it with leather or other material.

The dress fastenings mentioned are hooks and eyes; these they stamp out of sheet metal (preferring brass), and the improvement refers to the hook. They press out from the plate portion (by which the hook is attached to the dress) a stop; this “rising above the surface” prevents the eye “from “ coming out of the hook without considerable pressure.” They also slightly turn up the point or end of the hook “to “ facilitate its fastening in an eye.” The stop stands out under the point or end and retains the eye within the hook.

[Printed, *6d.* Drawing. See London Journal (*Newton's*), vol. 21 (*continued series*), p. 449; *Mechanics' Magazine*, vol. 35, p. 382; *Inventors' Advocate*, vol. 5, p. 202.]

A.D. 1841, November 2.—No. 9137.

SIMMONS, EDWARD ROBERT. —“Improvements in apparatus “ for preventing splashing in walking.” This apparatus consists of a shield made of leather or other material and a metal frame to which the shield is riveted. The frame is shaped like the frame of a spur; it has on the inside projecting points which rest on the upper part of the heel of the boot or shoe, and at each end a button whereto are attached a strap which passes under the sole and straps which buckle over the instep.

The invention admits of modifications; for example, a socket may be let into the heel, and the shield may be riveted to a stem which fits into the socket.

[Printed, *6d.* Drawing. See *Mechanics' Magazine*, vol. 36, p. 332.]

A.D. 1841, December 21.—No. 9201.

CARRON, WILLIAM. —“Improvements in the construction of “ clogs and pattens.” The sole of the clog is a thin plate of metal, by preference of tempered steel. The heel is riveted or otherwise fixed thereto, and the back leather is fastened to the heel. The tread consists either of separate pieces of wood

or leather riveted to the plate, so that "the flexibility of the plate may allow of the fore part of the tread bending between the parts," or of one piece of material riveted to the plate only near the toe, so that the plate "may bend in walking notwithstanding the length of the tread."

Another improvement in clogs consists in attaching the heel to the plate so that the clog can expand; slots are cut in the plate; screws passing through the slots penetrate the heel; and a spring affixed to the under side of the plate and lying in a recess in the heel allows of the extension of the heel.

Pattens are improved by applying to the fore parts irons which are "highest towards the back ends" and "approach the toe with curved surfaces;" the wearer "will be materially inconvenienced in walking."

The toe caps are made "by forming them in tools without cutting the leather." One tool is of the form of the exterior, the other of the interior of the cap. A piece of leather, softened with warm water and rubbed over with dubbing, is pressed into shape between the tools. The toe cap is afterwards japanned.

[Printed, *ed.* Drawing. See Repertory of Arts, vol. 18 (*new series*), p. 153; London Journal (*Newton's*), vol. 22 (*conjoined series*), p. 114; Mechanics' Magazine, vol. 37, p. 262.]

A.D. 1842, January 27.—No. 9232.

BAKER, WILLIAM.—"Improvements in the manufacture of boots and shoes." The feet of the wearer are protected from damp and cold by using as bottom fillings between the inner and outer soles "a layer of horse or other strong curled hair felted or matted together." In some cases there is introduced under the layer one of caoutchouc applied in the form either of cement or of a thin sheet.

[Printed, *ed.* Drawing. See Repertory of Arts, vol. 18 (*new series*), p. 299; London Journal (*Newton's*), vol. 22 (*conjoined series*), p. 118; Mechanics' Magazine, vol. 37, pp. 232, 575, 583; Record of Patent Inventions, vol. 1, p. 338.]

A.D. 1842, January 27.—No. 9236.

MASON, SAMUEL.—"Improvements in clogs, part of which improvements is also applicable to boots and shoes." India-rubber clogs are lined at "only the heel and toe parts," thereby causing the clogs when not in use to have a bent shape, but

when on the boot or shoe to adhere firmly thereto. Or the sides may be lined, "the fabric being placed with the warp diagonally," so as "to allow of the stretching of the india-rubber."

Some clogs are made with "a bent spring sole" so as to cause the heel and toe "to approach each other when taken off."

Others are made with a bent spring sole and with a frame or band to fit the heel instead of with a tread.

Others are made without either bent sole or tread; they are held to the boot or shoe by a frame through which a screw passes and enters the heel.

Others are made with a tread, from the back of which rises a plate carrying either a screw or a spring catch for attachment to the heel.

The last part of the invention consists in applying a layer of india-rubber cement to the outside of the inner sole after it is sewn to the upper leather, a layer of like cement to the inside of the outer sole, and uniting them by pressure. If a welt is used, the outer or lower side thereof is coated with cement.

[Printed, 1s. 10d. Drawings. See Repertory of Arts, vol. 2 (*enlarged series*), p. 265; London Journal (*Newton's*), vol. 22 (*conjoined series*), p. 116.]

A.D. 1842, April 8.—No. 9318.

CARLOTTI, MARC.—(*A communication.*)—"Improvements in the construction and manufacture of boots, half boots, shoes, clogs, and galoshes." The first part of this invention consists in the "introduction and concealment of a wooden sole between the outer leathers, sole, and lining" of boots, &c., thereby affording protection from damp and dispensing entirely or nearly so "with the necessity of sewing the sole and the vamp, "and the various pieces of the sole together," and at the same time "preserving the appearance of a sole of leather only."

The sole may be either jointed or not, or in two distinct pieces, namely, a toe and a heel piece united by a piece of leather; it is concealed by means of a "thin narrow metal ribbon" and a strip of leather which is turned down over the metal, "tightly folded under the wooden sole, and there nailed fast." A leather sole is nailed on to the wooden sole.

The second part consists in so making clogs and goloshes as to supersede the employment of instep straps, &c., and to enable the wearer to put them on or take them off "without the application of the hands or the necessity of stooping."

A spring is fixed along the upper surface "when the clog has no heel joint," otherwise "across the heel joint." Within the back of the heel "a thin metal half circle" is fastened to the sides thereof by pivots whereon it is to work. "To the centre of the lower part" of the half circle is fixed a spring "curved so as to raise this half circle when the foot is introduced into the clog, and to press it against the heel of the boot or shoe." Other modes of constructing the heel so as to effect the same object are described in the Specification.

[Printed, 19d. Drawing. See London Journal (*Newton's*), vol. 22 (*conjoined series*), p. 119; *Mechanics' Magazine*, vol. 37, p. 604; *Record of Patent Inventions*, vol. 1, p. 193.]

A.D. 1842, April 21.—No. 9326.

NOEL, WILLIAM.—"Improvements in the manufacture of boots and shoes." The improvement consists in inserting a spring between the insole and the outer sole, thereby giving "a great degree of elasticity or flexibility" to the boot or shoe and doing away with "the insertion of shank pieces for the purpose of giving rigidity and stiffness to the waist."

The spring is of "thin well-tempered steel, slightly curved," and covered with paint or other suitable substance; it is pinned at one end to the back of the sole under the heel; the other end is free and "allowed just to reach the joints or half-way between the toe and heel."

The spring may be fastened at the front end and "allowed to enter and work in the heel," or it may be fastened at the waist and each end be left free. But the patentee prefers the mode of fastening first described.

[Printed, 6d. Drawing. See London Journal (*Newton's*), vol. 22 (*conjoined series*), p. 121; *Record of Patent Inventions*, vol. 1, p. 205.]

A.D. 1842, May 12.—No. 9349.

BROWNE, JOHN.—"Improvements in the manufacture of mud boots and overalls." The leg part is composed of two separate sides, "similar in their construction, but capable of

“ separating from each other by their being respectively affixed
“ to a spring which is affixed to the heel by sewing or other-
“ wise.” The spring has hinged to it “two frames,” to which
the sides of the boot are sewn, and in order to keep the sides
to their shape, “additional frames are affixed” to the others.
The object of the hinges is “to facilitate the movement of the
“ leg when walking.” The spring has at all times “a tendency
“ to close the two sides” so as to cover the leg. The boot
may be readily taken off “by separating the sides,” which
“ will separate as if they were on hinges.” This mud boot
has, says the patentee, “the appearance of a split boot.”

The hinged frames above mentioned are shown in the sheet
of drawings as being on the top of the spring; they may be
lower down, and the sides of the boot may be fastened by
buttons. Sometimes the hinges are dispensed with. The con-
struction and arrangement of the frames may be varied.

[Printed, 10*d*. Drawing. See Record of Patent Inventions, vol. 1, p. 284.]

A.D. 1842, August 3.—No. 9436.

TURNER, ARCHIBALD.—“Improvements in the manufacture
“ of muffs, tippets, ruffs, mantillas, cloaks, shawls, capes,
“ pellerines, boas, cuffs, slippers, and, shoes.” The fabrics
used in the manufacture of these articles are either woven in
“ warp and shuttle looms” or in “warp machines or warp
“ lace machines,” or “made in knitting or stocking frames or
“ machines,” so as to have one surface thereof composed of
“ loops at least three-sixteenths of an inch long.” Some-
times these loops are cut as in the manufacture of “velvets
“ and cut carpets,” at other times a pile is raised “on
“ the uncut loops,” thereby producing “a fabric of a novel
character.”

Yarns of various sorts may be used, but by preference “soft
“ spun yarn similar to German wool, in order that the looped
“ surface may be close and full.” The method of weaving
looped fabrics is not claimed, although it is described at length
in the Specification.

The fabrics are cut into the required shapes, and are made
up by sewing; they are afterwards lined, &c., “as is well
“ understood.”

[Printed, 2*s*. 6*d*. Drawings.]

A.D. 1842, December 3.—No. 9529.

MANSELL, THOMAS.—"Improved machinery for cutting or shaping leather, paper, linen, lastings, silks, and other fabrics." The patentee employs his machinery for "shaping the fronts of Wellington, Clarence, and Blucher boots."

The frame of the machine consists of two uprights tied at bottom by a cross-piece. A pinion turned by a winch gears into the teeth of a wheel whose axle is carried by the uprights. Near each end of the axle is mounted a pinion in gear with a rack which is concealed in each upright. The ends of a strong plate of zinc pass through slots in the uprights and are attached to the racks. Two cast-iron frames turn on axles carried by the uprights; their lower ends approach or recede from each other by means of "mechanism at the bottom of the machine." This mechanism consists of two screws (one right, the other left-handed) jointed to the frames and working in two boxes which are fastened together by flanges and are kept in position by projections on the cross-piece; the mechanism is worked by turning the flanges with the hand. The shape of the zinc plate and the cast-iron frames is somewhat similar, as may be seen in the annexed sheet of drawings; "the upper surfaces" and "the internal faces" of the latter are "highly polished."

A piece of leather of the proper shape for the front of a boot is soaked in water, and a small quantity of dubbing is spread over the part corresponding to the instep; the piece is then laid on the upper surface of the cast-iron frames; the frames are adjusted as to distance "to suit the kind of leather employed;" the winch is turned, the zinc plate descends between the frames and stretches the leather so as to give it the proper form. The patentee prefers to pass the leather twice through the machine, lessening the distance (the second time) between the plates "so as to require considerable force to pass the zinc plate and leather between them."

[Printed, 6d. Drawing.]

A.D. 1842, December 8.—No. 9544.

KEMPSON, WILLIAM.—"Improvements in the manufacture of muffs, cuffs, ruffs, tippets, mantillas, pellerines, dressing gowns, boots, shoes, slippers, coats, cloaks, shawls, stocks, cravats, capes, boas, caps, bonnets, and trimmings for parts

of dress." These articles are made from a fabric called by the patentee "artificial fur," namely, a knit or looped fabric "having a close nap or pile produced thereon by introducing "wool, hair, or other fibrous material not previously made "into yarn."

The fabric is made in an ordinary stocking frame, having applied thereto an apparatus "for supplying a sheet or sliver "of wool or other fibre," or "with warp guides applied thereto "for inlaying the fibres into the fabric produced by the "knitting or stocking machinery." Each arrangement is described, but the patentee states that "this combination of "machinery is not new, and forms no part of my invention;" the "course of working" also is explained.

The fabric when taken out of the frame is coated on the back with gum, size, or other flexible cement; a calico or other cloth fabric is secured to the back, and the "artificial "fur" is then ready to be cut up into the required shapes.

[Printed, 3s. Drawings.]

A.D. 1842, December 8.—No. 9546.

BARBER, RICHARD.—"Improvements in the manufacture of "boots, shoes, and clogs." The sole is made by preference in two or more parts in order that "the tread or fore part" may "bend in the act of walking." To the bottom of the soles is fixed by brads or by sewing "horn or hoof" pressed into shape between dies. The horn or hoof "should be so "impressed on the under surface which comes to the ground "with prominences and concavities as to allow of grit getting "in and filling up the cavities, so as to prevent slipping;" the dies too should be formed to produce indents or holes for the brads or for the sewing.

[Printed, 4d. No Drawings. See London Journal (*Newton's*), vol. 23 (*conjoined series*), p. 196; *Mechanics' Magazine*, vol. 39, p. 269.]

A.D. 1843, March 16.—No. 9667.

ROBERTS, MARTIN JOHN.—"Improvements in the com- "position of ink, blacking, and black paint."

[No Specification enrolled.]

A.D. 1843, June 15.—No. 9782.

MASON, SAMUEL, and BEDELLS, CALER.—"Improvements "in the manufacture of boots, shoes, slippers, overalls, and

"clogs, and improvements in machinery or apparatus used in such manufacture, and in the preparation of materials for the said manufacture." 1. Preparation of materials:—The materials used for the fore parts or a portion of the fore parts are fabrics of silk, cotton, or other fibrous substance; these are rendered elastic by the introduction of "strands or threads of india-rubber." For ladies' overalls the fabric preferred is of "worsted or woollen yarn" combined with india-rubber threads.

2. Manufacture:—The upper part consists wholly of elastic fabric, except (if preferred) "the small vamp at the toes." Sometimes the hind parts or quarters are made of leather. Sometimes the hind parts are made of elastic and the fronts of inelastic material. Clogs require "a stronger fabric than that employed for making boots or shoes." The binding used is either a narrow fabric "rendered elastic by being partly of india-rubber," or an "elastic cord of india-rubber" sewn on to the edges. The insole and the outer sole are fastened on by means of waterproof cement (by preference of india-rubber) and pressure. Double-soled or stout single-soled boots or shoes are further secured with sprigs or wooden pegs.

3. Apparatus for cutting soles:—Two metal moulds of the shape of a sole (the one concave, the other convex) are mounted on sliding axles which are moved to and fro by screws. When the leather is introduced, the moulds are "kept correctly in position" by means of pins which are placed in the notches of suitably arranged "lever catches." Each mould can turn on its axis, and has "the proper bevil at the edges" so that the sole "may not require to be afterwards cut;" the workman turns the moulds on their axes as he cuts the edges of the leather with his knife. One mould may be made with points, the other with holes, for perforating the sole with peg-holes during the pressure.

4. Apparatus for combining the upper with the insole:—A metal last is placed on a standard with the sole upwards. When the upper is put on to the last and the insole is laid on, a plate carried by an arm is brought down and kept pressed on the insole by aid of a projection and a spring catch. The edges of the upper having been coated with cement are pressed down on to the insole by "a smooth rubbing instrument." If the vamp is not of elastic fabric, the last must be made with a removable part.

5. Apparatus whereon the insole is coated with cement :—A plank carries “six forms on standards.” As many partly formed boots or shoes are placed on the forms ; an open frame sliding on a bar is brought over each in succession, and the workman rubs the uncovered portion of each insole with cement.

The outer sole roughened and coated with cement is fixed to the insole by pressure in a screw press or otherwise.

[Printed, 4s. 4d. Drawings.]

A.D. 1843, July 3.—No. 9814.

VERITY, JAMES.—“Improvements in the heels and soles of “boots and shoes.” 1. Revolving heels which may carry a spur box :—The principal parts are a bottom which revolves, a case having at top and bottom a ring projecting inwardly, and a top plate. The bottom has a plate fixed thereon ; both plate and bottom have “a hole through the centre tapped with “a female screw ;” and at the back the bottom carries a stud “by which the heel is prevented from turning when in use.” A screw enters from above the plate ; it “is upheld” by a spring fixed at each end to the lower ring of the case. Each end of the spring has “a slotted hole to allow of play.” The lower ring is pierced with a row of holes into any one of which the stud can enter “by drawing the heel outwards” and turning it partly round. The top plate is screwed to the heel of the boot, and the case to the top plate, holes being made through the upper ring for the purpose.

2. “Applying spikes or roughings to the soles and heels of “boots and shoes :”—A plate with steel points or sharp studs riveted to it is screwed to the sole, and another to the heel. Or “a series of plates” may be applied, leaving space between each to allow of greater freedom of bending the sole. Sometimes the plate and studs are made “by hammering steel when “heated into a mould.”

3. Applying cork soles :—A welt of thick leather is sewn to the insole and upper, thus leaving “a vacant space under the “tread of the foot ;” a thickness of cork or india-rubber combined with cork is placed therein ; the middle sole is stitched to the welt, and the outer sole is secured to the middle sole by sewing or pegging.

—4. Combining india-rubber with particles of cork or wood for the purpose of making soles :—Ground cork or sawdust is mixed with india-rubber cement to such an extent as to allow the compound to be spread on cloth or other fabric. When a sufficient thickness has been obtained by means of several layers of the compound and a coating of india-rubber cement between each layer, the coated fabric is to be substituted for cork.

[Printed, 1s. 6d. Drawings.]

A.D. 1843, July 6.—No. 9819.

WRIGHT, JOHN, and WRIGHT, RICHARD.—“Improvements “ in boots and shoes and other the like coverings for the feet.” The first part of this invention relates to the preparation of the leather :—When the skin is taken out of tan and before it is subjected to any currying process, the patentees “oil the grain “ with good clean oil,” then “stuff the fleshy side with good “ oil and tallow well mixed with a portion of turpentine” and hang it up to dry. They next “sam it and shave and well “ scour it,” stuff it again lightly with oil and tallow, and when again dried “whiten and finish it for use.”

The second part relates to the method of attaching soles to uppers :—“An extension of the upper leather” is substituted for the ordinary welt. The inner sole and the outer sole are both sewn to the extension, and “a small neat strip of neat “ leather” is sewn in “with the stitch that fastens the extension of the upper leather to the inner sole.” This method conceals “certain of the stitches which would otherwise be “ visible” and leaves “only one row of stitches to be dealt “ with by the finishing iron.”

[Printed, 6d. Drawing. See London Journal (*Newton's*), vol. 25 (*continued series*), p. 247.]

A.D. 1843, December 28.—No. 9997.

ELVEN, ROBERT NOYES.—“Improvements in the manufacture “ of boots and shoes, goloshes, and clogs, which improvements “ are applicable to the manufacture of leather hose and “ buckets.” The uppers of boots, shoes, &c., are secured to the insoles “by splitting the edges of the insoles,” inserting the edges of the uppers between the split portions, and driving pegs of wood or metal through the whole; sewing however

may be used. The outer soles are fastened to the insoles by similar pegs.

The patentee claims the invention of "diagonal pegging." He uses "two rows of pegs" "inclining in opposite directions" so that "the two or more thicknesses of leather so combined" "with pegs cannot be separated without a force which would" "injure the leather so combined."

The last employed is made with a removable "block" and a female screw "formed through the hind part;" a screw having a ring at the top is thrust into the female screw, and, "pressing upon the loose piece of the last, such piece will be" "pressed against the inside of the heel of the boot, &c., while" "the last will be raised out from the pegs." If the pegs are of metal, the parts of the last which come into contact with the pegs must be covered with metal.

One sheet of the drawings shows three instruments with cutting surfaces for removing the projecting ends of the wooden pegs.

[Printed, 1s. 4d. Drawings. See Repertory of Arts, vol. 4 (*enlarged series*), p. 93.]

A.D. 1844, February 27.—No. 10,084.

HARBOTTLE, THOMAS.—(*A communication*).—"Machine" "for manufacturing boot soles, taps, and also for rivetting" "leather, hose, traces, and for other purposes." This machine is designed principally for punching holes and inserting and fastening rivets in the holes.

A shaft is mounted across the middle of a horizontal bed, and from near the middle of the shaft five cams project, the middle one actuating a driver lengthways on the bed. One end of the driver passes through a guiding standard; to the other end is secured a flat cast steel cutter plate, fitted to slide close upon a plate of like shape and confined by an upper fixed cutter plate, through which is screwed a steel tube tempered and forming a female cutter. The rod to be made into rivets passes down the tube through a corresponding hole in the sliding cutter plate and rests on the lower plate. The sliding cutter plate should be bored out on its upper surface opposite the tube for the reception of a square steel disc, wherein holes are drilled corresponding to the hole in the cutter tube.

In a line with the driver is a cap having a flange which moves backward and forward a rider placed directly over the sliding

cutter plate. The rider carries two vertical punches, the one for punching holes, the other for inserting rivets into the holes. Directly underneath the punches is a stud whereon the punching and riveting are performed. On each side of the rider is a standard, and between the standards is the fulcrum of a punch lever, whose back end is forked and raised by two of the cams twice in every revolution of the shaft. On the side of one fork is a stud which traverses in a groove formed on the inside of an eccentric secured to and moving with the shaft; the groove keeps the forks continually pressing on the cams and shaft alternately. The punches are raised with and by the punch lever; they are kept up alternately by spiral springs when not forced down by the lever.

Directly under the supporting plate is a horizontal guide wheel, having a toothed rim and ranging in a line with the space between the ends of the punches and their stud; it moves on the upper end of a vertical shaft periodically by means of a ratchet wheel on the lower end of the shaft. A pawl catches into the ratchet at each recession of the driver and thereby moves the sole or other article the required distance. The guide wheel, shaft, and ratchet turn on a pin screwed through a gauge slide which is placed in front of the bed through an opening under the rivet stud. The gauge slides along a bracket and is fixed in position by an index lever. The pawl is forced into the ratchet by a horizontal lever on the slide, the lever being drawn back at each recession of the driver by a tumbler.

The connection of the parts and the working of the machine are explained in the Specification.

[Printed, 1s. Drawing. See London Journal (*Newton's*), vol. 26 (*conjoined series*), p. 89.]

A.D. 1844, March 14.—No. 10,099.

ROBERTS, CHARLES.—"Improvements in the manufacture of "boot and shoe trees, lasts, and stretchers." 1. Stretchers for boots and shoes:—The rod of the stretcher carries a screw (having a conical head) which passes through a female screw fixed in the foot part. The inside of the foot part is hollow to allow the conical head to be moved to and fro therein. On each side of the foot part and over the instep are plugs "which can be forced out from the stretcher;" the heads of the plugs

when within the foot part "are flush with the surfaces thereof." When the stretcher is to be used, a band "which has holes "through it," is "placed over the outside" of the boot or shoe; and the turning of the screw will force out the plug or plugs at the parts required.

2. Expanding boot trees :—The tree consists of two parts, one for the front and one for the back of the leg; the latter slides within the former, "there being slots or openings on "either side" of the front part "through which screws pass" into the hind part, so that the parts "are retained together "correctly, yet are allowed to expand and contract." The tree is held by a block let into the top, and two screws pass through female screws "affixed to the inner end of the block." Each screw carries at its end a wedge, the one causing the upper part, the other the lower part of the tree to expand. On the inside of the front part near the foot a block is fixed; opposite on the hind part is another block carrying pins which slide in holes in the front block and keep the blocks "correct." The lower part of the tree is expanded by forcing one of the wedges between the blocks. The upper part of the tree is expanded by a like arrangement.

[Printed, 1s. 4d. Drawings.]

A.D. 1845, February 4.—No. 10,509.

SMITH, WILLIAM HENRY.—"Improvements in the construction of boots and shoes and other coverings for the legs and feet, and also in the means of or apparatus for fastening the same upon the leg or foot." The first part of this invention consists in a mode of cutting out the leather so as "to dispense "with some of the seams that ordinarily exist;" this mode is represented in one of the figures in the sheet of drawings; a short boot is cut out "of one piece of leather and without "having a seam behind up the back of the heel or at one "side."

The second part consists of a fastening for boots, gaiters, spatterdashes, &c. Two pieces of steel or other elastic material are required; they "are bent outwards in opposite directions;" the one is made with a point at each end, the other with boxes or sockets to receive the points. This fastening admits of several modifications; studs and slots may be substituted for

points and sockets or may be used in addition to them ; one piece may be notched at each end, the notches receiving studs on the other piece ; one piece may be pierced with a headed slot near the ends, the other may carry corresponding studs ; sometimes the pieces " are curved in the same direction, but one to " a greater degree than the other."

Some gaiters are fastened by affixing to one side a strip of metal furnished with studs which correspond to certain holes similar to button holes made in the opposite side ; " a thin " strip of metal running up one side of the gaiter prevents it " from rising up, slipping, or working down."

The third part relates to the construction of a " ventilating " hunting boot which is open all the way down to the ankle." The leg part is closed by one of the improved fastenings, the thigh part by buttons and button holes.

[Printed, 16d. Drawing. See *London Journal (Newton's)*, vol. 27 (*conjoined series*), p. 178.]

A.D. 1845, May 29.—No. 10,692.

KEENE, CHARLES.—"Improvements in boots, shoes, gaiters, " overalls, and other like articles of apparel." The patentee describes several methods of manufacturing these articles so as to render them " more or less weather and waterproof and " more easy of wear."

1. The leather or other material is coated one or more times (wholly or partially) on one or both sides with a solution of gutta percha alone or mixed with " caoutchouc, or sulphur, " or colouring matter;" or with gutta percha in a plastic state, either alone or mixed with such matters, or with " French " chalk or other soft powder."

2. Pieces of sheet gutta percha are interposed between two pieces of the material, for example, between the inner and outer soles, and between the upper leather and the lining.

3. Instead of leather, " a compound fabric " is used wholly or in part ; it is made by adding to gutta percha (alone or combined as before-mentioned), while in the kneading machine " a portion of leather dust, or hair, or bristles, or ground " cork, or woollen shearings, or other membranous or fibrous " substance in a finely comminuted state."

4. Or the fabric may consist of a bat of cotton or other fibrous substance saturated with a solution of gutta percha

alone or mixed with caoutchouc; the solution contains by preference sulphur and colouring matter.

5. The articles when made of the compound fabric are formed by casting them in cored or other moulds; if they are cast in more than one piece, the joints are united by passing a hot iron over them.

Articles "now ordinarily made of unsulphurized caoutchouc" are improved by exposing them for from 30 to 60 minutes to the fumes of sulphur in a close vessel heated to from 200° to 250° , and by immersing them for the same length of time "in a bath of melted sulphur."

[Printed, 4*l*. No Drawings. See Repertory of Arts, vol. 9 (*enlarged series*), p. 170; London Journal (*Newton's*), vol. 23 (*conjoined series*), p. 432; Mechanics' Magazine, vol. 44, p. 269.]

A.D. 1845, September 4.—No. 10,823.

VAUX, JOHN.—"Improvements in apparatus for warming "boots and shoes." This warming apparatus consists of trees and lasts composed of separate parts, some or all of which are hollow to contain hot water.

The boot tree is made up of four parts, a foot, a front leg, a hind leg, and a central or wedge part; the front leg is hinged to the foot (it need not however be hinged to it); the other parts may be joined or brought together in various ways, and each is supplied at top with a covered opening.

The last is made up of two or three separate hollow parts "similar to the lower parts of a boot-tree," each capable of containing hot water.

Sometimes the hind part of the boot leg is not made to hold water; it is formed with a door and may hold "blackening and brushes, &c."

[Printed, 10*l*. Drawing.]

A.D. 1846, March 11.—No. 11,121.

GREEN, WILLIAM, and WALKER, MARK.—"Apparatus for "facilitating the putting on of boots." Three standards supporting a semicircular frame are screwed or otherwise fastened to a base. The outer legs are perforated with slots in which "suspending hooks are adjustable" by means of set screws. The inner sides of these legs "are furnished with square "notches or recesses," into which the square shoulder of

the hook fits "to prevent the hooks from slipping should the set screws not be screwed fast enough." The middle is cut with a mortise in which a clip is adjusted by a set screw.

The boot is to be hung up by its loops on the hooks; the back part of the top of the boot is to be placed in the clip, and "the foot may be easily thrust in" without any "unpleasant straining and exertion."

A contrivance similar to a folding boot jack may be appended to the base.

[Printed, 8d. Drawing. See London Journal (*Newton's*), vol. 29 (*conjoined series*), p. 392; Patent Journal, vol. 2, p. 557.]

A.D. 1846, March 25.—No. 11,149.

SMITH, CHARLES.—"Improvements in cooking and culinary utensils, and methods of heating and suspending or fastening articles of domestic use, and similar purposes." Part of the ninth of the eleven inventions claimed by the patentee is the forming clogs, pattens, shoes, or feet warmers, and the use of the comminuted or solid pumice stone, or other solid or comminuted matter, or hot water or other hot solution to such articles."

"Hollow cases of metal or other suitable material are made to fit the feet," or of "any other suitable form." They are made either in one piece or in two pieces hinged together, and with compartments to hold hot water, pumice stone, or "similar or any suitable hot matter." Leather or other soles are attached through perforations formed in the projecting rim of the bottom of the cases, and tongues or straps are sewn on to the upper parts. Cloth or leather uppers, toe sockets, heel flanges, patten rings, &c., may be applied to the cases.

[Printed, 3s. 6d. Drawings. See London Journal (*Newton's*), vol. 29 (*conjoined series*), p. 356.]

A.D. 1846, May 22.—No. 11,217.

WRIGHT, CHARLES.—"Improvements in the manufacture of boots and shoes." Three improvements are claimed; (1) fastening the upper leathers to the soles and the heels to the soles and the inner and outer soles together by means of plugs; (2) waterproofing the materials of which boots and shoes are made by means of an improved mixture; (3) venti-

lating boots and shoes by the introduction of an air-passage through the heel.

1. The plugs are of three kinds; the different shapes are shown in the annexed sheet of drawings; they are made of zinc or copper, or copper tinned or galvanized, or other malleable metal tinned or galvanized; when driven in the thin ends are clenched against an iron or metal-bound last. Or the heels may be sewn on as usual, and the lifts and top pieces be fastened on with the plugs.

2. The waterproof mixture may be made in either of the following ways:—(1) Dissolve 1 lb. of india-rubber in half a gallon of spirits of coal tar; add 1 gallon of boiled linseed oil, 1 quart of gold size, 2 lbs. of litharge ground in oil, $\frac{1}{4}$ lb. of ground ammonia, and 1 lb. of vegetable or other black. Simmer the whole over a slow fire and stir until all are well mixed together. (2) Dissolve over a slow fire 1 lb. of india-rubber in 1 gallon (or less) of boiled linseed oil, and add thereto 1 lb. of litharge ground in oil and $\frac{1}{2}$ lb. of vegetable or other black. Two or three coats of either mixture are to be rubbed into the material, and the surface when dry is to be smoothed with pumice-stone or glass-paper or sand-paper.

3. "A metal spur box with a prolonged tongue of elastic material pierced with holes forming the upper side of the box" is worked into and through the heel and along the sole between the outer and inner soles. Then holes corresponding with those in the tongue are made through the inner sole.

[Printed, 6d. Drawing. See London Journal (*Newton's*), vol. 30 (*conjoined series*), p. 407; Patent Journal, vol. 2, p. 446.]

A.D. 1846, September 24.—No. 11,383.

LAMB, JAMES. — "Improvements in the manufacture of clogs." These clogs cover only the fore part of the boot or shoe, the heel "not being covered by the clog."

Two arrangements are described; in the first a leather strap "which passes behind the heel" is connected to the clog by means of springs either of coiled wire enclosed in a leather case or of vulcanized india-rubber. By this means "the fore part of the clog will be constantly drawn on to the foot by the springs." This back strap "is kept from rising too high" by a strap "which passes under the foot." The clog

is fastened by the following straps which are united by a ring ; two straps fixed to "the fore-part of the clog ;" two "affixed to the back strap," and a strap "which passes over the foot through the ring" to a buckle at one end of the said strap.

In the second, the springs are not used ; the back strap (by preference of metal) is "hinged to the fore part of the clog," and the strap which passes under the foot is also (by preference) of metal. The fastening straps are similar to those before-mentioned.

[Printed, 10*d*. Drawings. See Patent Journal, vol. 2, p. 754.]

A.D. 1846, October 2.—No. 11,392.

BRYERE, PIERRE.—"Improvements in the manufacture of boots, shoes, and clogs."

[No Specification enrolled.]

A.D. 1846, November 19.—No. 11,445.

BROCKEDON, WILLIAM, and HANCOCK, THOMAS.—"Improvements in the manufacture of articles where india-rubber or gutta percha is used." The processes of treating, purifying, and colouring these substances, are those described in the Specifications of Letters Patent previously granted to Mr. Thomas Hancock and to Mr. Alexander Parkes, and the proportions therein enumerated are found "to answer well for general operations."

The vulcanizing or "change" is now produced "by immersion" of the article when manufactured ; this forms the difference between the present and the former inventions, the operating being "on the manufactured article in place of acting on the raw material of caoutchouc, gutta percha, or the compounds of these materials."

The articles belonging to the present series, which are affected by this invention, are shoes, boots, goloshes, uppers, quarters, vamps, soles, shoe and boot fastenings, linings of vamps, and the interior of shoes, goloshes, &c. The caoutchouc, gutta percha, or a compound thereof, is formed into sheets "with or without gritty or colouring matters and fibrous substances ;" the sheets are moulded or formed into the articles required ; and the change is produced "either when in the form of sheets or after making them up into such

“articles as may be thought most convenient.” When the articles “require seams or to be otherwise sewed together,” the solution employed for uniting the parts “will require afterwards to undergo the change by applying the converting solvent with a brush or otherwise.”

If the exterior of the article is of cloth or other texture, the fabric is protected (when producing the change) from the action of the changing agent “by forming the air-proof lining in such a manner as to cover the whole interior of such fabric and obtain the change by pouring in the changing solvent, allowing it to remain only for the necessary period.”

Substances, liable to injury by contact with the changing solvents, are saturated or coated with glue size; this is afterwards removed by rinsing in warm water; or “an aqueous solution of lac” may be used and be afterwards removed by any suitable alkaline solution.

[Printed, 6d. No Drawings. See Repertory of Arts, vol. 10 (*enlarged series*), p. 103; Mechanics' Magazine, vol. 46, p. 504.]

A.D. 1846, December 7.—No. 11,478.

DACIE, JOHN. — “Apparatus to be attached to boots and shoes, for the purpose of protecting the wearer from splashes of mud in walking.” The apparatus consists of a guard or shield, “which will receive on the under face thereof the splashes,” &c.

For gentlemen's boots a piece of metal is cut out to embrace the heel and form a ledge round it. The outer edge “is bent down to form a lip.” To attach the guard to the heel, a pin or stud is to be fixed in the back of the heel for the inner edge to rest on, and a loop of vulcanized india-rubber secured to the ends of the guard “will bind against the inner side of the heel.”

For ladies' boots or shoes made with low heels the guard is curved, “so that its outer edge will be higher than its inner edge,” the lip being still retained. To secure the guard to the boot or shoe it is provided with a metal bar, “which binds against the hollow part of the sole,” when a sandal or similar fastening connected to the guard is brought over the instep; it is prevented from slipping “by its inner edge resting in the indent made by the junction of the upper leather and the sole.”

Sometimes the guard is placed below the heel, and the required height is obtained by means of a false heel of leather, gutta percha, or other substance. The guard is a flat piece of metal with a lip; the false heel has a pin passed through it, which enters the heel of the boot or shoe and keeps the guard in its place; it has also a shoulder "which fits against the hollow part of the sole." A recess is cut "in the under side of this shoulder" to receive an elastic strap which passes round the instep.

[Printed, 6d. Drawing. See Patent Journal, vol. 3, p. 80.]

A.D. 1847, May 14.—No. 11,702.

GRAY, JOHN THOMAS.—"An improved boot and shoe." These boots and shoes are improved by attaching to them revolving heels and revolving surfaces similar in construction to the heels.

The revolving heel is composed of (1) a ring of leather having a circular recess in it and nailed or otherwise fastened to the sole; (2) a ring of metal "of a conical or bevel form" placed in the recess and "furnished with a number of pins or prongs;" (3) a circular plate of metal fitting the inner surface of the metal ring and secured to the sole by screws; this plate "by means of its beveled edge" retains the metal ring within the recess in which it revolves; (4) a ring of leather placed on the prongs, the internal space being "filled up by a piece of leather," which "may be readily moved in order to get at the screws" (which fasten the metal plate) "without disturbing the ring of leather" last named; (5) a heel piece to sustain the wear also secured to the prongs.

The bevel surfaces of the metal ring and plate "are truly turned and ground together in order to insure a uniform friction in their working one within the other, which will at all times be sufficient to prevent motion resulting when in use, and yet admit of being readily turned by the hand when desired."

[Printed, 10d. Drawing. See London Journal (Newton's), vol. 31 (conjoined series), p. 358; Patent Journal, vol. 4, p. 555.]

A.D. 1847, September 2.—No. 11850.

FORSTER, THOMAS.—"Improvements in machinery for cutting india-rubber, in rendering fabrics waterproof, and

"in making articles therefrom, and in dissolving india-rubber and other gums." The patentee claims as one part of his invention, the application of coloured compositions of india-rubber or gutta-percha (or combinations of them) and other flexible gums to "the outside of the fabric, and the manufacture of garments, as coats, hats, caps, boots, and other articles;" he does not however mention any especial application of his invention to boots.

The best composition "for composing the colour with" consists of 20 lbs. of india-rubber combined with 4 lbs. of shellac, and a solvent of spirits of wine at 60 over proof and oil of coal at 30 over proof in equal proportions by measure. The india-rubber combination is mixed with half the solvent; then, "as the basis" of the colour, hydrate of sulphur (6 lbs. to every 15 lbs. of rubber) is rubbed through a fine sieve and is mixed with the other half of the solvent; the two are then mixed together in a masticating machine which is "to be used cold." Another good colouring basis consists of (by weight) one half of hydrate of sulphur mixed with one half of fine Cornish clay in powder, or with one half of oxide of tin; to these other colours may be added.

The fabrics treated with the foregoing are finished by coating them on one or both sides with a composition having "Cornish white for the base;" to this is added any required colour, "a little good parchment size, or a thin solution of caoutchouc, or any other proper vehicle for binding the colours."

The seams of these waterproofed articles are sewn with thread "prepared with stearine or spermaceti and wax."

[Printed, 1s. Drawings. See Repertory of Arts, vol. 11 (*enlarged series*), p. 209; Patent Journal, vol. 4, p. 430.]

A.D. 1847, September 30.—No. 11,880.

DE BARROS, IGNACIO.—(*A communication.*)—"Improvements in machinery for making lasts for boots and shoes, butts or stocks for fire-arms, and other irregular forms." The machinery is arranged and constructed "upon two different principles;" in one machine circular saws are employed, in the other a straight saw to which reciprocating motion is given. Patterns of cast-iron of the exact shape and size of the articles

to be made are placed in each machine and are acted upon by adjustable tracers or guides; these, being in contact with the surface of the patterns and following all their irregularities, cause the saws to cut the blocks into the exact shape presented by the patterns. The lasts are made in pairs, and the machine (with circular saws) shown in the drawings is adapted to the simultaneous manufacture of three pairs.

The patterns, "furnished at each end with projections or "prolongations," are held between chucks, one of which is adjustable. On the surface of each pattern are two metal tracers set in arms which turn freely on axles. The arms extend beyond the axles and carry weights which counterbalance a part of the mechanism at the opposite ends, but allow the tracers to press on the patterns. The axles of the circular saws are placed between the arms; the saws "are thus made to follow the rising and falling motion communicated to the tracers by the metal patterns." In order that the saws may operate upon the blocks (with which they are constantly in contact) "a rapid rotary motion" is communicated to them; they are arranged "in a line" with the tracers, and the framing which carries them "is capable of moving backward or forward in the direction of the length of the "lasts." The saws "act upon and cut the wood as long as the guides or tracers are not in contact with the patterns;" therefore, to save time and cessation of work, "it is necessary continually to change their position with respect to the "blocks," and "to vary the position of the blocks and the "patterns." For this purpose the patterns "rotate simultaneously" with the blocks, and at the same time "communicate to the frame which carries the saws a reciprocating "rectilinear movement and also an up and down movement."

The machine shown, in which a straight saw is used, is capable of producing at once four pairs of lasts. The saw is fastened to a cross-piece "capable of rising and falling to a "certain extent by its own weight" and kept horizontal by vertical guides; the reciprocating motion is obtained by appliances and gearing, which "communicates a rotary and rectilinear motion to the block and patterns."

A full description of each machine is given in the Specification.

[Printed, 1s. 6d. Drawings. See Patent Journal, vol. 4, p. 469.]

A.D. 1847, October 14.—No. 11,909.

FISHER, DAVID.—“Improvements in the manufacture of “ boots and shoes.” The improvements are—

1. Rendering parts of boots and shoes elastic :—A strip of vulcanized india-rubber, having a tape laid into its edges, is sewn at one edge to the upper and at the other edge to the sole by means of a welt. Sometimes strips are applied at the seams which connect the front and back of boots and shoes. Ladies’ boots are rendered elastic by inserting a piece of elastic fabric at the back. Boots which lace or button at the side have a strip of india rubber or elastic fabric let in on one or both sides of the opening.

2. Fastening soles to uppers by cement :—The upper and inner sole are lasted ; a press made to fit the sides of the last holds the upper in place ; the upper overlaps the insole about half an inch ; holes are punched round the edge of the upper ; a solution of gutta percha or india-rubber is spread under the perforated edge ; the solution when the edge is pressed down passes through the perforations ; when the solution is dry, a coating of solution is spread over the whole of the bottom, and when this is dry, the outer sole is caused to adhere by other coatings and pressure.

3. Making heels :—A piece of leather is blocked into the shape of a heel ; the two edges are joined with rivets or a metal plate ; the inside is filled with gutta percha or similar matter in a plastic state, either before or after the blocked piece is sewn on to the boot or shoe.

4. Making soles :—These are made (1) with an edge of leather round a sole of gutta percha ; (2) of strips of leather cemented on edge side by side, or of alternate strips of leather and thin layers of sheet india-rubber ; (3) with “ pieces of spongy india-rubber or gutta percha,” secured to either surface of the insole by a thin covering of thin leather, or used as a filling between the soles ; (4) by kneading into gutta percha powdered slate, coal, pumice, glass, and linseed boiled to a jelly, separately or combined. Heels may be made of this compound.

5. Combining leather soles and heels by gutta percha waists :—The inner end of the sole passes “ between or into the “ substance of the gutta percha ;” the sole and heel are

cemented-on, or the sole may be sewn to a welt and the waist be cemented-on.

6. Ventilating boots and shoes :—A perforated plate is let into a conical opening in the waist.

[Printed, 1s. 6d. Drawings. See Repertory of Arts, vol. 12 (*enlarged series*), p. 38; Patent Journal, vol. 4, p. 576.]

A.D. 1848, July 26.—No. 12,221.

THOMAS, WILLIAM.—(*A communication.*)—"Improvements in the manufacture of stays, boots, and shoes; also in fastening or connecting fabrics and garments." Eight improvements are claimed, of which the seventh relates to the manufacture of boots, and the eighth to a mode of connecting trousers and gaiters to boots and shoes.

The upper part of the boot is made "by sewing the selvages or edges of narrow elastic fabrics spirally together," thereby increasing the elasticity of the upper part and dispensing with "the vertical seams heretofore used."

"Bow springs pressing and holding by their ends" are put into the lower parts of trousers and gaiters; the ends of the springs hold "by pressing at the sides of the waist of the boot or shoe;" if desired "there may be projecting edges to pass under the foot."

[Printed, 4s. 6d. Drawings. See Mechanics' Magazine, vol. 15, p. 114; Practical Mechanics' Journal, vol. 1, p. 278; Artizan, vol. 7, p. 154; Patent Journal, vol. 6, pp. 163 and 177.]

A.D. 1848, October 26.—No. 12,296.

CLARK, JAMES.—"Improvements in the manufacture of boots, shoes, and clogs." One improvement consists in the following mode of manufacture :—A thin piece of gutta percha is moulded "round partly under the heel of the last" for the stiffening and foundation of the heel. The upper part of this piece is introduced between the outer leather and lining of the heel part of the upper, causing it to adhere by heat or solution or both. A strap of gutta percha (warm or with the help of solution or both) is stuck on "so as to come half an inch to one inch (more or less) up round the foot and over the toes, between the bottom part of the vamp and its lining, sticking it securely to each and leaving an edge of the gutta percha about half an inch round the vamp." A piece of gutta

percha or canvas saturated with gutta percha is then attached to the last as an insole, and the upper is lasted thereon and the whole is securely fastened together by heat or solution or both. A coating of solution is laid over all and allowed to dry; and then a leather or gutta percha sole is added. Pegs or nails are used to build the raised part of the heel.

Another improvement consists in making clogs or goloshes with an elastic waist, so that they "will elongate" and may be put on without stooping or using the hands and yet hold well on the feet without a fastening. The heel is made separately and is united to the fore part with a band of india-rubber or other elastic material. If india-rubber is used, its edges are "interlaced with threads," so as to hold the stitches in attaching it to the heel and fore part; it comes up "each side of the quarter and under the sole." It is preferred to make a man's golosh "with a box or sunk heel."

A third improvement consists in forming heels at the upper part so that they shall clasp each side of the foot under the ankle and hold fast on the foot by pressure. For this purpose gutta percha or a spring is introduced into the upper part of the heel.

[Printed, *8d.* Drawing. See London Journal (*Newton's*), vol. 34 (*conjoined series*), p. 333; *Mechanics' Magazine*, vol. 50, p. 426; *Patent Journal*, vol. 7, p. 37.]

A. D. 1848, December 28.—No. 12,392.

POOLE, MOSES.—(*A communication.*)—"Improvements in "the manufacture of heels for boots and shoes, of swivels, of "bag fastenings, of revolving furniture, and of the connections "of pipes for gas and other fluids." This invention relates to screw-fastenings; male and female screws are so combined that the former having passed through the latter, the stem alone shall remain therein; the thread of the male then acts as a stop to prevent its return.

In the heels of boots and shoes an upper part carrying the female screw is affixed to the heel by screws or otherwise; a lower part, furnished with a male screw and "a portion of "leather or other suitable matter," is screwed on to the upper part until "the thread passes beyond the thread of the female "screw." Although the two parts will not readily separate, they will allow the lower part "to be turned from time to time

"into a different position, so that the wear may be equal." In the upper part there is one cut, and in the lower four cuts, the object being to insert a pin or stop.

[Printed, 8d. Drawing. See *Mechanics' Magazine*, vol. 51, p. 16; *Repertory of Arts*, vol. 14 (*enlarged series*), p. 351.]

A.D. 1849, January 16.—No. 12,423.

BUCHLER, EDWARD. — (*A communication*). — "Improvements in the manufacture of boots and shoes, also applicable to other fabrics." First improvement:—Metallic hooks produced by machinery are used instead of "hemp in the manufacture of boots and shoes."

The hook-cutting machine is mounted on a work bench, which carries also a press and a vice; it is screwed to an iron platform. A lever, bolted to beams and worked by hand, "serves to work the principal organs of the machine." The wire for making the hooks passes through a tube connected to an orifice in an iron plate "when effecting its transit" to the shears. The upper blade of the shears is fixed to the lever "and follows its ascending and descending motion;" the lower blade is fixed permanently to a plate which is screwed to the platform. A punch screwed to the lever forces the cut wire through a matrix, and while the wire is receiving its curved form "impresses on it three notches serving to keep the hook fast after being hammered in." A spring screwed to the lever pushes the cut wire under the punch. A box under the platform receives the hooks from the matrix.

In introducing the hooks into the soles "an easel" (described in the Specification) is employed. Holes are drilled "in the contours of the soles;" the hooks are hammered in and their ends are riveted on a "block with three iron feet of different sizes serving to equalize the interior sole."

Second improvement:—"Preparing the heels and welts of boots and shoes." These parts are made in suitably shaped matrices of cast brass formed with openings in front for taking out the parts when made. The leather is soaked in water and stretched while wet; it is then cut into pieces of proper size; the pieces (taking care "to season them with very good size") are laid one on another until the matrix is filled, and pressure is applied by means of a press. The heels are fixed to the soles by the hooks.

The boots and shoes "are finished by the usual mode of sewing."

[Printed, 1s. Drawings. See *Mechanics' Magazine*, vol. 51, p. 67; *Patent Journal*, vol. 7, p. 181.]

A.D. 1849, March 14.—No. 12,519.

DE BARROS, IGNACIO.—"Improvements in machinery for making lasts for boots and shoes, butts or stocks for fire-arms, and other irregular forms."

[No Specification enrolled.]

A.D. 1849, April 26.—No. 12,591.

BURKE, WILLIAM HENRY.—"Improvements in the manufacture of air-proof and water-proof fabrics, and in the preparation of caoutchouc and gutta percha, either alone or in combination with other materials, the same being applicable to articles of wearing apparel, bands, straps, and other similar useful purposes." The "fourth head" of this invention relates to the manufacture of heels and soles of boots and shoes. The patentee cases the outer edges of heels and the toes and sides of soles (made of gutta percha) with metal forming therewith tips or shields for the gutta percha. These tips or shields are made with countersunk holes or with projections on the inner face; they are moulded-in with the heels and soles, and the gutta percha "will imbed itself in and around the tips or shields and hold them firmly in their place."

[Printed, 4d. No Drawings. See *Repertory of Arts*, vol. 14 (*enlarged series*), p. 365; *London Journal (Newton's)*, vol. 35 (*conjoined series*), p. 384; *Mechanics' Magazine*, vol. 51, p. 430; *Patent Journal*, vol. 8, p. 69.]

A.D. 1849, July 18.—No. 12,709.

WALKER, THOMAS.—"Improvements in boots and shoes and in the manufacture of parts of boots and shoes, clogs, and goloshes." The improvements relate to the manufacture of revolving heels; four modifications are described.

1. The heel consists of four parts; (1) a metal ring formed to receive and retain (2) a disc of leather or gutta percha capable of revolving therein when the ring is secured to the seat of the heel; (3) a ring of leather or gutta percha pinned or otherwise fastened to the seat and securing the metal ring;

(4) a thickness of leather or gutta percha pinned or cemented to the disc.

2. "The outer wearing surface of the heel" is a metal ring formed with a shoulder all round on the inside to receive a centre of leather, gutta percha, or other material not metallic; the ring is capable of revolving round the centre, and the centre is pinned or otherwise fastened to the body of the heel.

3. This differs from No. 2 only in the form of the inner surface of the metal ring and the outer edge of the centre; they are cut in a slanting direction.

4. A conical metal ring is used "of a form corresponding with the inner surface" of an outer ring; "these parts are retained with a capability" of the outer ring "revolving by means of the parts which consist of leather, gutta percha, or other suitable non-metallic material" and are pinned or otherwise fastened to the body of the heel.

The patentee claims also the mode of manufacturing the rings "used to retain together the parts of revolving heels":—He cuts out a disc of metal, subjects it to the operation of "stamping tools suitably formed to bring the metal into the required shape," and then by means of piercing tools removes the centre, leaving the ring of the form required.

[Printed, 8d. Drawings. See *Mechanics' Magazine*, vol. 52, p. 75.]

A.D. 1850, June 6.—No. 13,103.

NEWTON, WILLIAM EDWARD.—(*A communication*).—"Improvements applicable to boots, shoes, and other coverings for or appliances to the feet." The first part of this invention consists in providing the under surface of soles and heels with projecting metallic points to prevent the wearer from slipping or sliding. These points may be applied in various ways:—(1) Headed rivets may be inserted through perforations in the heel and sole, and if desired a piece of cloth or canvas may be cemented on over the heads. (2) The points may be cast with a metallic plate; the plate may be placed on the inner surface of the heel and sole, and the points may pass through perforations as before. (3) The plates may be prepared with large perforations between the projecting points so as to present the appearance of open or basket

“ work with the points projecting at the crossings.” (4) The points may be fixed in a piece of india-rubber which is to be cemented to the heel and sole.

The second part relates to foot holders which are to be worn over boots and shoes :—These consist of a partial or entire sole furnished with projecting metal points and with an elastic strap ; an entire sole requires a toe cap as well as a strap.

The third part relates to clogs :—These are made of india-rubber compounded with $\frac{1}{2}$ lb. of sugar or resin or “ other substances which will evolve gas in large quantities during the curing process.” The mould used “ is so formed as to make the sole thin with a rim all round, and protuberances within for the boot or shoe to rest on to give the foot the required elevation from the ground.” The sole can be provided with a toe-piece and heel strap or other means of securing it. Sometimes the sole is made thick in parts and thin in other parts within the rim.

The last part consists in making india-rubber shoes “ pervious to perspiration and yet impervious under ordinary circumstances to water or damp.” For this purpose “ india-rubber sponge ” is rolled out into sheets before making it up ; it will be found “ to be covered with a great number of very fine holes.” Or india-rubber prepared in thin sheets is perforated with very fine holes. The parts nearest to the sole should not be perforated, or they may be covered with an impervious material.

[Printed, 4d. No Drawings. See London Journal (*Newton's*), vol. 41 (*continued series*), p. 89 ; *Mechanics' Magazine*, vol. 53, p. 476 ; *Patent Journal*, vol. 10, p. 208.]

A.D. 1850, June 19.—No. 13,143.

ROBERTS, GEORGE.—“ Improvements in clogs and pattens.” These articles may be put on and off “ without stooping ” and untying.

“ The back piece to the heel ” is connected at its lower end to the extremity of a click which works upon a pivot “ in a slit formed in the heel of the clog.” Across the click at right angles passes a plate of iron “ inserted across the heel or upper part of the sole.” Underneath the plate is fixed a latch acted on by a spring. One end of the latch “ protrudes a

" little beyond the edge of the clog and is covered with a piece of gutta percha." The latch, when in its usual position and when the back piece is in its proper place, " catches in a notch " in the click " and prevents the back piece from falling down."

In putting on the clog, the back piece is down, and the pressure of the foot on the click " causes it to press down on the latch ;" thus " the back piece of the heel springs up close to and clips the heel." To remove the foot from the clog the wearer presses forward a little the end of the latch, " at the same time raising the foot a little."

Modification :—The heel piece is moveable and provided with a slide " running in a groove from heel to toe." The end of the slide is turned up, and the toe presses against it and pushes it forward to the end of the clog when the clog is to be put on. The under part of the slide " at the end working in the heel " is enlarged ; it has " a notch at its under part," across which passes a spring or bar having a knob protruding beyond the edge of the clog. When the knob is pressed down, the spring is removed from the notch, allowing the heel piece to slide back.

[Printed, 8d. Drawings. See London Journal (*Newton's*), vol. 37 (*conjoined series*), p. 92 ; Mechanics' Magazine, vol. 53, p. 179 ; Patent Journal, vol. 10, p. 271.]

A.D. 1850, September 12.—No. 13,253.

LONGDON, ROBERT, the younger, and TABBERER, THOMAS PARKER.—" Improvements in the manufacture of looped fabrics." The " sixth part " of this invention consists in making " a compound elastic fabric for the uppers or socks of boots " by means of knitting. An elastic band is produced " at the upper part as heretofore " (this the patentees do not claim), and with this are combined " portions of elastic fabrics " containing india-rubber " vulcanized and worked-in " in the " stretched state."

The upper is lined with brown holland or other inelastic fabric except at the parts over the ankles ; at these parts pieces are cut out, and the vacant spaces are filled up with the elastic fabric.

[Printed, 1s. Drawings. See Repertory of Arts, vol. 17 (*enlarged series*), p. 263 ; London Journal (*Newton's*), vol. 38 (*conjoined series*), p. 254 ; Mechanics' Magazine, vol. 54, p. 233.]

A.D. 1850, December 4.—No. 13,382.

BERNARD, JULIAN, and DUREUILLE, JEAN BAPTISTE.—
“Improvements in the manufacture or production of boots and
“shoes, and in the materials and machinery or apparatus to be
“employed therein.” The Patentees describe (1) a machine
“for hammering the leather preparatory to its being worked
“into boots or shoes”—A pillar supports a table in the
middle of which is a block of stone or marble. The hammer
shank carrying a removable weight at its top slides in vertical
bearings. The hammer is worked by a tappet fixed to one end
of a shaft which moves in bearings on “the main pillar.”
The shaft carries a fast and a loose driving pulley, and at its
outer end a fly-wheel.

(2) A machine for “cutting out the soles, heels, vamps,
and linings”—A bed, supported on legs, carries a cast-iron
bracket support. “The pressing surface” is secured to a
vertical sliding rod, whose upper end is connected to the
shorter end of a “double oscillating lever,” working on a
centre in the bracket support. The longer end of the lever
is connected to and worked by a crank on a horizontal
shaft. The shaft is in gear with the driving-shaft whereon
are fast and loose pulleys and a fly-wheel. The bed for
receiving the force of the press is a cast-iron plate, sup-
ported by a beam running the whole length of the machine.
Rails on the upper surface of the plate act as guides to a
traversing table, which slides out for the purpose “of bringing
“different cutters under the pressing surface.” The leather
is cut by suitable punches; it is placed on a “metallic cutting
“plate,” and on it is placed the required punch. The table
being pushed in, the punch is brought under the pressing
surface, “which is made to descend by the action of the crank
“on the oscillating lever.” A modification of this machine,
“but of slighter construction,” is described.

(3) A bench for paring down the edges of the linings:—Near
one end of the bench is fixed an inclined board, having a flat
piece of metal secured to its upper surface. A cramp, working
on a fixed centre, has its upper end flattened out and its under
surface roughened in order to hold the linings which are placed
between it and the plate; its lower end is fitted with a cross
piece; the workman astride on the bench and pushing the

cross piece forward with his feet keeps the lining held fast under the cramp end and pares down the edges.

(4) "Mechanism employed in mounting the upper leathers":—Inside a fixed frame is a moveable frame, which oscillates "either vertically or horizontally" on "relative axes," kept in their places by springs and worked by treadles. An iron support is bolted to the bottom of the moveable frame; on its top are two pins which enter holes in the under side of a last. The upper surface of the last is faced with iron round the edge. Two moveable iron frames, working on centres, are attached to the moveable frame; their tops are fitted with bearings through which levers work. One end of the levers is forked and carries a pin which takes into the teeth of double racks. A cord is fastened to the lower end of each rack; it passes thence "through the longer limb" of pincers, round guide pulleys, and has its other end knotted to the shorter limb of the pincers. Bars running the whole length of the metal frames act "as detents to the numerous racks by catching "into the smaller teeth on their under sides." Two cranked rods working through "hanging brackets" hold the last firmly down on its support. The inner sole and the upper leather, "having been already perforated in the ordinary manner," are placed upon the last, "the sole being firmly fixed down by the "agency of the cranked rods." The edges of the upper leather are "laid hold of by the pincers on both sides at "once." The pincers are made to bite by means of the levers and the racks. The iron frames are brought down, "thus approaching a horizontal position." The edges of the upper leather being thus pulled and laid over the inner sole, the two "are now tacked together sufficiently to hold them "until the next operation." The heel piece is mounted by a cord secured to it; the cord passes over a pulley "working in "a small bracket on the under side of the top of the moveable "frame." This frame is to give the workman "greater "facility in getting to the different pincers." Two modifications of this mechanism are described.

(5) "The operation of making the heels":—Pieces of leather of the requisite size and shape are put into a metal matrix having two pins (projecting from its under side) which fit into holes in a table adjustable by means of a wedge "which works on the inclined surface" of a fixed table. A hammer having a vertical

stroke fits into the matrix ; it is keyed on to the lower end of a sliding rod connected to a lever which works on a fixed centre in a cast-iron bracket support. The lever is actuated by a crank eccentric and connecting rod. "To produce the necessary concavity of the inside of the wheel," a suitably shaped steel die is placed inside the matrix ; the die is also fitted with a projection to secure it to the table. The sole is set to the form of the foot by placing it between two dies and putting the whole under a press.

(6) "A nail-making and cutting machine:"—The nails "consist simply of short lengths of wire." The driving shaft is mounted on a cast-iron plate ; it is fitted with a fly-wheel and a fast and a loose pulley. A crank gives motion to a lever which works on a centre. The shorter end of the lever carries a steel cutter, and immediately under the cutter is an anvil. When the machine is in motion, the crank coming against the under side of the lever depresses the shorter end, and the workman, "taking a shoe in his hands" places all the projecting nails in rotation on the anvil, "when the descent of the cutter immediately cuts off the portion protruding." The nails are made at the other end of the machine. The wire, wound on a revolving drum, passes through a tube attached to a traversing table. A rack on the under side of the table is moved by a pinion, which "receives a reciprocating movement" by the intervention of a lever and a connecting rod attached to a revolving crank on a shaft. This shaft carries a spur wheel and receives its motion thereby from a pinion keyed on to the driving shaft. The required lengths of wire are cut off by shears whose cutting parts are "shaped like wedges in order that a tapered cut may ensue." A cam keyed on to the shaft (which carries the crank) gives motion to the shears ; "it revolves between them and having one portion thicker than the rest causes their opposite or cutting ends to approach and make the required cut." By adjusting the connecting rod "any required traverse may be given to the tube."

(7) Machinery for nailing the soles and heels to the upper leather:—The last with the upper leather and inner sole complete is fixed on two supports capable of adjustment in distance and height ; a cushion prevents the surface of the

leather from being scratched. A vertical slide working through the top of the frame of the machine carries at its lower end a guide; its upper end is linked to a lever, one extremity of which works on a fixed centre while the other end has connected to it a stirrup to receive the workman's foot. The guide "is for the purpose of guiding and traversing" a rod containing a mandrel. The arrangement of the guide, rod, and mandrel is explained in the specification. "The outline of the guide must correspond exactly with the shape of the course in which the nails are to be inserted." A metallic frame, "having its under surface shaped to fit accurately the undulating surface" of the sole and pierced with holes suitable for the insertion of the nails, is held firmly on to the sole by links connected to a lever and to lugs on each side of the frame. The working of this machine is described. In order that some nails may be driven in obliquely the rod is jointed. In the "heel nailing machine" the last is fixed on a support; the leather heel is laid on, and on top of it is placed an iron perforated heel which is pressed firmly on to the leather heel by a lever working on a centre in one side of the frame and kept down when required by a rack and spring in the other side. The mandrel, &c., are arranged "in a manner somewhat similar" to that before-mentioned.

(8) Machinery for "the polishing and finishing of the soles and heels":—The bed of the machine has fixed to it five standards; "the three inside ones each carry a steel centre point sliding loosely through it," upon which spindles with their polishers revolve. The polishers shown in the drawings are for heels; they are "slightly conical;" the first three should be of steel, the fourth of bone; the first is toothed like a rasp, the second like a file, the other two are smooth. At each end of the machine is a tightening screw. Motion is imparted by pulleys and belts. The mode of polishing and finishing is described.

[Printed, 2s. 10d. Drawings. See *Mechanics' Magazine*, vol. 54, p. 475; *Practical Mechanics' Journal*, vol. 5, p. 56.]

A.D. 1851, January 31.—No. 13,482.

MARSDEN, CHARLES.—"Improvements in boots and shoes." The object of this invention is to "admit of a free circulation

“ of air through ” boots and shoes, which object may be effected in either of the following ways :—

1. Groves are cut in the lower side of the inner sole ; these when the outer sole is put on “ form so many air pipes or “ channels ; ” they may be filled with “ metallic tubing or “ quills.” Holes communicate through the inner sole with the interior of the boot. Other holes “ open into a conical “ vertical passage ” formed “ on the inside of the boot between the outer covering or leather and the lining.” There may be one or more similar passages on each side. The upper end of the passage is open to the external air ; the lower end terminates in the last-mentioned set of holes, which communicate with the grooves “ by means of a thin piece of thin corrugated metal plate,” inserted between the outer and inner soles. A piece of grooved leather or other pliable substance may be substituted for the plate. The passage is carried to such a height “ as to exclude under all ordinary circumstances “ the entrance of wet or dirt.” A thin strip of brass is laid “ along the outer edges ” of the last-mentioned holes “ to prevent the stitching from closing them up,” and “ another bent strip of metal encircles the mouth of the passage.”

2. The inner sole is perforated with air holes and with other holes which communicate with a passage formed between the lining and the upper leather of the boot.” The two sets of holes are connected by thin pieces of corrugated brass plate. The passage “ is carried some distance up the “ leg of the boot upon the inside by means of a grooved piece “ of leather ” terminating at top in two holes which are open to the external air.

3. The boot may be also ventilated from the top “ by making a few holes in the vamp or upper and covering them over with an open ornamental piece of leather,” or “ by using a light under vamp with vent holes in it and making the holes communicate with a common aperture of escape in the exterior vamp.”

The arrangements described for ventilating boots “ may with slight modifications be with equal advantage adapted to the ventilating of shoes and feet coverings of all descriptions.”

[Printed, 10*d.* Drawing. See *Mechanics' Magazine*, vol. 55, pp. 119 and 170; *Patent Journal*, vol. 11, p. 234.]

A.D. 1851, April 30.—No. 13,611.

WEBLEY, PHILIP.—“Improvements in the manufacture of “ boots and shoes, and in rendering the said manufacture “ waterproof ; also in the machinery and materials to be used “ therein.” The specification contains (1) a detailed description of a machine “ for nailing the heels of boots and shoes ;” of this an idea may be formed by describing the action of the principal parts. The article to be nailed is placed with its heel in a recess (in a fixed frame) drilled vertically through with holes corresponding in number and position to the nails to be inserted. A rod is brought down on to the last by a screw and hand wheel. A traversing frame inside the fixed frame and carrying two slides (one furnished with steel piercers, the other with steel mandrels, “ having flat ends ” whereon the nail heads rest), brings the piercers immediately under the holes. A vertical slide by the agency of an eccentric forces the piercers into the heel, “ the downward stroke of the eccentric withdraw- “ ing them again.” The eccentric being thrown out of gear, the attendant moves the slide carrying the mandrels and nails into position ; the eccentric getting again into gear presses up the vertical slide, and the nails are thereby forced into the holes. A helical spring brings down the mandrels after the insertion of the nails.

2. The manufacture of a “compound leather” :—Scraps and parings of leather are steeped in warm water, then partially dried, and saturated with a solution of size or glue. The scraps are put into a perforated metal case which is subjected to the action of a press until “the superabundant liquid” is expelled. When the mass is dry, it is reduced to minute particles by rasps and cutters arranged in a machine which is described in the Specification. The raspings are steeped in hot water, are then dried in a heated chamber, and are then ready for mixing with gutta percha or caoutchouc ; the mode of mixing is explained.

3. A method of rendering boots and shoes waterproof :—A thin sheet of gutta percha is moulded (while warm) over the last on which the boot or shoe is made ; “this has the effect “ of producing a thin gutta percha sole moulded to correspond “ exactly to the curvatures of the sole.”

The patentee does not restrict himself to the foregoing details or arrangements.

[Printed, 1047. Drawing. See *Mechanics' Magazine*, vol. 55, p. 378; *Practical Mechanics' Journal*, vol. 4, p. 226; *Patent Journal*, vol. 12, p. 75.]

A.D. 1851, May 3.—No. 13,621.

PYKE, JAMES. — "Improvements in the manufacture of leather, also in the making of boots and shoes." Heat is applied "when extracting tannin from bark or other material." At the bottom of the vats or pits pipes for the circulation of hot water or the passage of steam are placed sufficient to heat the liquor to from 150° to 200° Fahr., and over them is placed a perforated false bottom. The material is put above, and the liquor is drawn off from below, the false bottom. Covers of galvanized iron, made "so as to produce a water joint all round the edges, prevent the atmosphere from getting to the liquor." When the liquor is cold, it is put into pits of the ordinary construction. The hides hang vertically in the pits, and the bars by which they are suspended are so constructed that they "will form a cover to the pit," whilst they keep the hides separate.

The leather after being tanned is rolled "when in a damp state," and this part of the invention consists in the use of a roller "made partly of metal and partly of elastic material" so that the surface of the roller will be of metal in numerous parts and the interior elastic;" the manner in which the patentee prefers to construct the roller is explained.

In making boots and shoes the patentee uses (1) an iron mould-box, "having two air tubes rising up within it;" (2) a mould of vulcanized india-rubber with a wooden filling piece inside; (3) a last having round its edge a steel plate formed with inclines for clenching the points of brads; (4) an apparatus for forcing the last, upper, and insole into the mould; (5) a box containing a block of vulcanized india-rubber "having an opening through it," which is placed on the cover of the mould box; (6) cutters for ensuring the exact size and shape of the outer sole; (7) a frame provided with ratchet grooves and a sole-plate "perforated with as many holes as there are to be brads or pegs used" and carrying an "ejector" which consists of a "plate of metal supported on a wide spring;" (8) a "broaching frame" carrying as many points as there are to be brads or pegs; (9) a frame

containing brads or pegs; and (10) a punch-frame. A similar apparatus is used for puncturing the holes and punching in the brads required in fixing heels. In making boots an opening is made through the bottom of the mould box that the uppers may pass through. Sometimes rivets are used instead of brads; they consist either of "hollow shells similar to those used for closing letters," or of "heads with hollow stems." The process of manufacture is described in the Specification.

[Printed, 1s. 4d. Drawings. See Repertory of Arts, vol. 19 (*enlarged series*), p. 22; Mechanics' Magazine, vol. 53, p. 397; Patent Journal, vol. 12, p. 77.]

A.D. 1851, June 17.—No. 13,668.

MACHIN, JOHN.—"Improvements in boots and shoes." The improvements relate to the heels; these are circular and are made in such manner that they can be readily attached and detached and readjusted "so as to present a fresh point of bearing."

A circular metal plate having a screw fixed to its under side is placed between the insole and the sole; it is not fixed, and the screw passes through the sole. A circular piece of leather, gutta percha, or other material suitable for wear, "forms the moveable part;" it has a plate of metal fixed to its upper side. This plate "has a centre bush" tapped with a screw thread. The fixed part of the heel consists of "circular lifts" perforated to admit the bush and "surmounted by a ring lift" of the same thickness as the last-mentioned plate. The moveable part may be readily attached or detached "by screwing or unscrewing the same." The whole of the moveable part may be of metal. To prevent the heel from revolving whilst the wearer is walking, the length of the screw "must be so regulated that the two surfaces of leather shall come in contact before the screw is home."

To present a fresh point of bearing the moveable part is unscrewed; the screw and its plate are "turned a portion of a revolution, a notch or sawgate being cut in the end of the screw for that purpose;" and when the moveable part is screwed home again "its position will be found to have altered."

[Printed, 6d. Drawing. See Mechanics' Magazine, vol. 55, p. 518; Artizan, vol. 10, p. 38.]

A.D. 1851, November 13.—No. 13,808.

BERNARD, JULIAN.—“Improvements in the manufacture of “leather or dressed skins, and of materials to be used in lieu “thereof, and in the machinery or apparatus to be employed “in such manufacture.” This invention is divided into five parts, of which the third relates to the “production of a novel “fabric” called by the patentee “compound union leather,” and to be used as a substitute for leather in the manufacture of shoes and many other articles.

This fabric is composed of a woven or felted fabric and a layer of dressed skin produced in a sheet by means of the patentee’s “improved splitting machine or otherwise.” The two are united with “any suitable cement” and with pressure. One surface of the compound fabric is afterwards varnished or otherwise treated, and if the fabric is to be used for shoes, the varnish or japan should be applied to the leather surface. If a thick and stout fabric is required, a strong fabric is inserted between two layers of skin, and the whole is united with cement and pressure.

[Printed, 1s. 2d. Drawings. See *Mechanics’ Magazine*, vol. 56, p. 416; *Practical Mechanics’ Journal*, vol. 5, p. 56.]

A.D. 1852, January 27.—No. 13,931.

BERNARD, JULIAN.—“Improvements in the manufacture or “production of boots and shoes, and in materials, machinery, “and apparatus connected therewith.” This invention comprises mechanical arrangements (1) for cutting, shaping, and pressing soles; (2) for paring the edges of soles and uppers; (3) for lasting uppers; (4) for inserting plastic material into soles for securing them to uppers; (5) for inserting pegs into soles and heels; (6) for making pegs; (7) for rendering the materials for boots and shoes impervious to moisture.

1. An upper die carrying “a shear plate or cutting edge” descends by the agency of a cam and ascends by means of a coiled spring. A lower die ascends and descends by means of a weighted lever. When the dies are in action, the leather placed between them “will pass the shear or cutting edge” and “be pressed, shaped, and cut to the required form.”

2. A piece of “porous artificial stone” is placed upon a support which is embedded with cement upon a projection

formed on a wooden box. One end of a pipe is fitted air-tight into the bottom of the box ; the other end is connected to an apparatus for exhausting air. The sole placed on the surface of the stone and kept in close contact with it is operated upon by a knife, while a metal rim serves as a guide for the knife. One drawing shows "a transverse section of a similar stone" for shaping pieces of leather intended "to form that part of the heel of the boot which is nearest to the sole," another "for chamfering or bevelling the edges of the upper leathers."

3. The apparatus consists of (1) a cast-iron box having in its bottom a projecting pin for holding the last and a hole for the passage downwards of a pipe ; (2) two bags of waterproof cloth (between which the last stands bottom uppermost) fitted with tubes and stop-cocks ; (3) a last grooved across, fitted on to the pin, and having at the sole a hole through which the pipe passes ; this pipe has connected to its lower end a flexible tube fitted with a stop-cock ; (4) a metal plate which passes over two pins projecting from the top of the box ; (5) a plate perforated with small holes, secured to the last, and having attached to it a piece of felt or similar permeable substance so that "the sole is thus kept in close contact with the last by "atmospheric pressure;" (6) a plate "placed over the pins" and "secured in that position" by keys. The action of this apparatus is described.

4. The apparatus is shaped somewhat like a syringe. Nipples of various sizes can be screwed on ; the lower portion contains the plastic material which passes in through a pipe at the side, and the upper portion a piston of waterproof material ; the piston rod is hollow and connected to a tube which communicates with water placed at such a height as to afford the pressure required for forcing the plastic material out of the nipple through holes in a plate fixed over corresponding holes in the sole.

5. The pegs are contained in a tube, and below the pegs is a piece which moves backwards to allow of the descent of a peg, and forwards to prevent the untimely descent of the others. A hammer descends by aid of a handle and ascends by means of a coiled spring. On the hammer rod are inclines which force the piece back, and at the back of the piece is a spring which tends to move it forward.

6. A cast-iron bar bolted to the frame of the machine is connected by links to a slotted bar which is raised and lowered by a handle. The pins of "an arrangement of lazy tongs levers" pass through the slot which guides them in their proper course. A circular knife is "attached to the system of levers" by a pin. The leather placed upon an endless cloth is advanced to the required extent by an arrangement of cylinders, ratchet, pawl, cam, &c. (fully explained in the Specification), and a strip is cut off by the knife "which is traversed across and through the leather by the levers."

The strips are cut into short lengths by disposing them side by side and close to each other between two strips of metal, placing them on the endless cloth, and substituting "such a cam as will impart to the endless cloth a movement equal to the required length."

These lengths are charged with a solution of gutta percha and are then compressed into pegs by placing them between projecting pieces and bringing them into contact with slides actuated by screwed spindles.

The patentee describes "some of the modes" which he proposes to employ for connecting the outer sole to the insole and the upper.

7. The material to be waterproofed "is distended over one of the porous stones herein-before referred to;" the atmosphere is withdrawn; the leather is held tightly by the surface of the stone; and the waterproofing compound is brushed over the surface of the leather.

Each apparatus (and its action) is detailed in the Specification, but the patentee does not restrict himself to the details given therein.

[Printed, 2s. 4d. Drawings. See *Mechanics' Magazine*, vol. 57, p. 117.]

A.D. 1852, July 15.—No. 14,221.

POOLE, MOSES.—(*A communication*).—"Improvements in boots, shoes, clogs, and other similar articles." The insole, by preference of india-rubber either alone or mixed with substances which will not be injured by the heat of vulcanizing, has numerous small holes formed through it for the purpose of ventilation. The upper surface of the insole is covered with flannel. Pieces of vulcanized rubber placed at

intervals form a space between the insole and the outer sole. It is preferred that the outer sole should be of india-rubber prepared for making a hard substance resembling whalebone; it may be fastened on in any convenient manner. The upper is to be fixed to the insole with cement, and for some height above the sole it should consist of or be covered with india-rubber prepared for vulcanizing. Gores also when used should be of knit or looped fabric coated with rubber prepared for vulcanizing. The whole when put together is vulcanized. The outer sole may be applied after vulcanizing by cementing strong fabric round the outer edge of the insole before the vulcanizing. Instead of using fabric, hard material such as wood may be imbedded in the insole. An air passage is provided most conveniently at the heel; this is to be furnished with a plug for wet weather.

[Printed, 6d. Drawing. See Repertory of Arts, vol. 21 (*enlarged series*), p. 147; Mechanics' Magazine, vol. 58, p. 97.]

A.D. 1852, August 19.—No. 14,268.

CLOUGH, CHARLES BUTLER.—“Improvements in machinery “or apparatus applicable to the purposes of brushing and “cleaning.” This invention consists of two machines, one for brushing and cleaning various articles and substances (among which are mentioned boots, shoes, and leather), the other “for laying on by brushing” colour, varnish, polishing fluid, &c.

1. A framework supports two revolving shafts. The upper or driving shaft carries a handle at one end and a pulley at the other. The lower shaft carries a pulley (connected to the other by a gut or cord) and two brushes, which when the handle is turned “will revolve swiftly and thereby brush or clean boots, “shoes, or other articles that may be held in contact with “them.” This machine may be used for the purposes of brushing and cleaning, but it is “adapted principally for use “at doorways and other places.” The upper shaft may carry a brush.

2. The axles of a roller and of a revolving brush are mounted in standards, the roller being above the brush; under the brush is a trough to contain the colour, &c.; a handle is keyed on one end of the axle of the brush. To use this machine,

raise the roller, place the article or fabric between the roller and the brush; lower the roller, and turn the handle.

The patentee claims also "the application of gutta percha, " or india-rubber, or other elastic substances, to form the " foundation or back of such brushes, and the whole or any " part of the said rollers."

[Printed, 6d. Drawing. See *Mechanics' Magazine*, vol. 53, p. 196.]

A.D. 1852, September 10.—No. 14,287.

BERNARD, JULIAN.—"Improvements in the manufacture or " production of boots and shoes, and in materials, machinery, " and apparatus connected therewith." First improvement—namely, mechanical arrangements for lasting uppers:—This is stated by the patentee to be an improvement on the mode secured to him by letters patent dated January 27th, 1852, No. 13,931. In the present instance pliers are hung to the lazy tongs arrangement, and four perforated slides are employed, curved and shaped to correspond with the outlines of the sole. When an upper has been placed on the last, the last put into position in the box, and an insole laid on the sole of the last; the edges of the upper are inserted between the nipping surfaces of the pliers, and the slides are advanced until they come into contact with the upper, turn it down, and cramp it over the insole. The upper and the insole are united with pegs (by preference of cured gutta percha or leather) forced through the perforations in the slides and corresponding holes in the upper and insole.

Second; arrangement of mechanism for "puncturing the " soles and uppers, screwing said holes, infusing or filling " said holes with plastic material or composition, and, finally, " of attaching the heel to the boot or shoe:—The main driving parts are of the ordinary description. A hydrostatic cylinder, furnished with injection and eduction cocks and fitted with a piston, slides on rails which extend the whole length of the framing. The upper part of the piston is formed with a flange whereon is placed a framing upon which the last (with its appendages) is secured. Above is a moveable plate extending "nearly across the width between the back and " front framings of the machine," and to it is attached a plate whose under surface "should be of the same curvature as the

"last." Above this are compartments; in one is "a series of "spindles or piercers" with sharp points; in another a series inclined at an angle and screwed at their lower extremities for the purpose of cutting a helical groove in the holes made by the former series; in another a piercing or screwing series in a vertical position "and giving a greater range of action" for connecting the heel to a boot; these piercers are all arranged to have a downward and an upward motion. In another compartment is a box or vessel charged with plastic material and so constructed as to deliver a portion of its contents at the proper moment.

Third; stitching the outer soles near and around the edges:—The outer sole is fastened on by means of pegs; the stitching is intended "for ornament as well as connecting the edges "when composed of two or more thicknesses."

Fourth; waterproofing and at the same time strengthening the edges of uppers:—The edges nearest the sole are split to to a certain depth; a lining coated with waterproof solution is introduced; and the split parts and the lining are caused to adhere to each other.

Fifth; "double stitching" and "back and fore stitching":—The material is placed in "a compound sliding frame," one portion of which receives movement in a vertical direction, the other in a horizontal direction. One needle-holder with its appurtenances is secured at one side of the frame, and two similar needle-holders at the opposite side of the frame. If a needle is placed with its point towards the material on the one side, another needle in one of the holders on the other side, and the other holder on that side is empty, the action is as follows:—A hole is made in the material "by a piercer "suitably placed for that purpose." The needle on the one side is pushed partly through the material "by the action of "certain cams and rods." The needle is taken hold of on the opposite side to which it entered and drawn through the material by the nippers of the empty holder. These nippers are moved aside "by the action of certain cams and levers." The second needle-holder and its needle are at the same time brought opposite the hole. The second needle is pushed into the hole and gripped and drawn through by the now empty holder on that side. The compound frame is moved "a certain "distance in accordance with the design of the sewing." The

piercer is again brought forward; a like action is repeated; and thus two needles and their thread (each needle each time "being turned over and passed through the material") are "successively caused to pass through one and the same hole" and to perform the operation of double stitching.

Back and fore stitching requires one needle and two needle-holders. As this stitching is such as is "commonly practised" by tailors for the seams of garments," a description of it need not be given in the present series.

A very minute description of each apparatus will be found in the specification, and the patentee does not confine himself to the details given.

[Printed, 5s. Drawings. See *Mechanics' Magazine*, vol. 58, p. 255.]

A.D. 1852, September 30.—No. 14,305.

BELLFORD, AUGUSTE EDOUARD LORADOUX.—(*A communication.*)—"Improvements in the manufacture of boots and shoes, part of which improvements are also applicable to the manufacture of various other articles of dress." The first part of this invention consists in cutting-out the material of which a boot is to be made so that "the front or back or entire upper part can be made of one piece and folded or bent into the proper form for the boot" without what is called "crimping" or without stretching any part; the second in compounding certain ingredients to form a waterproof cement for holding together the edges of boots and shoes as well as the soles and uppers; the third in making rivets for the same purposes.

1. One figure in the annexed sheet of drawings "shows the shape of the piece from which the entire upper parts" are made; another "the same partly folded;" another the form "of a piece which forms the front and part of the back of a shorter boot;" another "the same folded." Lines are drawn to indicate the cutting and folding. The piece is so cut out that the back part of the heel is double, thus forming the heel stiffening.

2. The ingredients are gutta percha, 64 per cent.; india-rubber, 16 per cent.; pitch, 8 per cent.; shellac, 4 per cent.; oil or fatty matter, 8 per cent. The india-rubber being dissolved in spirits of turpentine or other solvent, the ingredients are to be "kept at almost boiling temperature for about three

"days," at the end of which time the preparation will be ready for use. The surfaces to which the preparation is to be applied should be heated sufficiently "to keep the composition melted for a short time."

3. The rivets "are of two kinds which are not widely different from each other." The one "consists of the ordinary metal eyelet-hole lining or a tube or flanch of similar form;" after it is riveted or burred the interior "is filled with solder or any easily fusible metallic alloy." The other "consists of a small tube and flanch and a small pin or screw passing through it;" the tube may be either plain or tapped outside. The tube and stem are passed through from opposite sides, and the stem is then riveted or soldered.

The riveting, with or without cement, may be used for joining garments.

[Printed, 10d. Drawing. See *Mechanics' Magazine*, vol. 58, p. 315.]

A.D. 1852, October 19.—No. 14,328.

NEWTON, WILLIAM EDWARD. — (*A communication.*) — "Improvements in machinery or apparatus for sewing." In this machine two needles are used; they operate alternately, "one working vertically and the other horizontally;" the latter is made "nearly circular instead of straight."

The operation of the machine is as follows:—The fabric being placed on the platform (which has a hole in it for the play of the vertical needle), this needle passes downward through the fabric and forms a loop on the under side thereof; the horizontal needle then passes through the loop, "forms another loop beyond and holds the first loop until the vertical needle is drawn up and pressed down again through the loop formed by the horizontal needle, which draws up the loop first made" and forms a double loop stitch.

The fabric is fed along under the vertical needle by "a notched bar" which has an "up-and-down" motion as well as a "forward and back" motion; it is held during the sewing "by the striking of the said bar" against a descending "yielding plate," and is released from the pressure of the plate by "the downward motion of the bar."

The "tightening the spools and producing a proper and even tension upon the respective threads" is effected by means of

metallic cones on whose ends the spools rest; they slide up and down on the spool rods and are prevented from rotating with the spools by pins or projections; the tension is altered by means of nuts.

A guide "which is used in putting binding upon cloth or "leather" is added when required to the machine; it is bent into "the proper shape for folding the binding upon the edge" of the fabric and has a slot in it "through which the binding "passes when folded."

The slack of the thread of the vertical needle is taken up by passing the thread between a semicircular projection and a wheel which is pressed against the projection by a spring; that of the horizontal needle by means of a bent lever which is moved backward and forward by another bent lever and is in connection with a spring.

[Printed, 1s. Drawings. See *Mechanics' Magazine*, vol. 58, p. 375.]

PATENT LAW AMENDMENT ACT, 1852.

1852.

A.D. 1852, October 25.—No. 512.

STOLL, JOHN JAMES.—(*Provisional protection only.*)—"Improvements in the manufacture of boots and shoes and similar articles, and in machinery used therein, entitled "Metallic toothed and wedged seams and waterproof elastic "indented stitches." The main object of this invention is to substitute for hemp and wax and brass screws "indented "or toothed stitches, which by means of the principle of the "wedge or of the lever cause their teeth to penetrate horizontally into the leather when the percussion takes place and join in this manner two or several pieces of leather, gutta percha, or any stuff of which the upper parts of shoes and boots are usually made, in a far more solid manner than

"could be done with either the screws of metal or the best workman making use of hemp and wax."

These "metallic stitches" are composed of "one, two, or several parts;" their shapes as well as their teeth "can vary infinitely;" the principle of fixing them is "always the same, that of the wedge or of the lever." In order to render the stitches and seams waterproof, the different parts are "with the exception of the teeth" covered with a thin coating of gutta percha, caoutchouc, or wax.

The last used is either of metal or of wood with a metal sole; thin openings are made in it for the admission of the nails which temporarily hold the insole on it.

The outer sole is formed of "small blades or ribbons of steel which become thinner as they get more distant from the centre of the sole." The ends of the blades "are formed like hooks, to which very strong thongs of caoutchouc are fixed, and which have their opposite ends also tied or fixed to other hooks" on the vice or frame holding the last. Between the blades are spaces "sufficiently wide to admit the awl to make the holes," &c.

The sole leather, instead of being hammered, is pressed between rollers of metal or of wood covered with metal or gutta percha.

[Printed, 4d. No Drawings.]

A.D. 1852, November 9.—No. 686.

McCARTHY, NELSON.—"Improvements in boots and shoes." The soles are made of a combination of wood and leather "curved at the front and forward part of the sole in an upward direction at an angle or inclination of about 60° from the horizontal line of the under surface to the extreme point of the toe."

The part exposed to wear is of leather from the heel to the toe; on this is placed a sole of thin wood "of unequal thickness in its peculiar formation," and above this an inner sole of leather "intended as a lining." The upper surface of the wooden sole is not quite flat, "but inclines downwards at an angle of about 10° from the heel to the point where the ball of the big toe rests, and about which point the upward inclination to the extremity of the sole commences;" it is

“ arched directly under the natural arch of the foot, and the heel is made to curve backwards independently of the forward curve.” The wooden sole may be waterproofed.

This compound sole is united to the upper leather in such manner that the wooden sole is completely covered, “the upper leather being brought down under the edges of the wooden sole previous to the bottom or exterior sole being attached.”

[Printed, 4d. No Drawings.]

A.D. 1852, December 15.—No. 1062.

WALKER, SUSAN.—“Improvements in clogs and pattens.” These articles are rendered “more durable and more com-
“ modious to the wearer” by covering the irons with gutta percha, caoutchouc, or other elastic material.

The iron when shaped is surrounded with the elastic material, and both “in a heated state” are “subjected to hydraulic pressure in a mould,” so that the surrounding material “may be perfectly adapted to the form of the mould
“ and may be brought into rigid coherence with the iron.”

[Printed, 4d. No Drawings.]

A.D. 1852, December 29.—No. 1190.

PITTAR, SAMUEL JOHN.—(*Provisional protection only*).—
“Improvements in goloshes or coverings for boots and shoes.” These goloshes are made “without a heel and back;” they are kept in place when worn by “elastic or other springs or
“ fastenings.”

The springs or fastenings are “peculiarly formed,” and when in use are “attached to or connected with the boot or shoe, either below the sole, or at the side or sides, or above the sole, or round the heel or back.” Sometimes “the upper portion of the golosh or some part thereof” is made elastic.

[Printed, 4d. No Drawings.]

1853.

A.D. 1853, January 6.—No. 36.

WHINEREY, ROBERT. — “Improvements in or upon the manufacture and treatment of leather, either alone or in combination with other materials.” In one part of this specification the patentee informs us that he fills-up the pores of “tanned sole or insole of leather as used for boots or shoes” with “prepared gutta-percha, india-rubber, gum, gum resin, oil, boiled linseed oil, tallow, bees'-wax, gelatine, tar, pitch, resin in solution, cement, or paste, either separately or in combination;” and that for the upper leather of boots and shoes he uses “a saponified or a partly saponified grease or dubbin rendered antiseptic or otherwise by a salt or salts of metallic oxides or an acid, either separately or in combination with each other;” and that for blackening the surface of the leather he employs “a solution of a salt of the peroxide of iron in combination with an alkali or an acid or both.”

In another part he informs us that he combines shavings, strands, or other pieces or shreads of leather or hide with a variety of substances animal, vegetable, and mineral, (which he enumerates), and “by masticating, kneading, mixing, rolling, or pressing,” he forms therewith many articles, amongst which he mentions a “round or flat rope, or band, or boots, [or shoes;” and, moreover, that he can “prepare leather and gutta percha that can be applied to boots and shoes in the same manner as gutta percha.”

[Printed, 4d. No Drawings.]

A.D. 1853, January 8.—No. 59.

PARKER, FRANCIS, and DICKS, WILLIAM. — “Improvements in boots, shoes, and that kind of spatterdashes termed anti-gropelos.” The uppers of these articles are made partly or wholly of “elasticated leather or cloth, such as is known in the trade as patent corrugated elastic leather or corrugated elastic cloth.” Boots or shoes made of this material “will fit tightly to the ankle without having a gore or gusset of

"any kind." The material is to be cut in such manner that the strips or threads of india-rubber therein "run across the" foot and hence admit of enlargement laterally."

In Wellington boots the part (excepting at the toes) of the upper, which passes over and round the foot, is made of the "elastic flexible leather fabric;" the plaits or puckers run "in a direction from the toes upwards over the instep." The seam is "up the back."

In jockey or riding boots "capable of being converted into" another form of riding boot," a piece of the fabric is let in at the back just above the knee; this answers the double purpose of rendering the boot flexible at that part and of allowing the portion above the knee to be "turned down into" the inside of the boot," when "the top may be slipped over" the outside of the boot" and be fastened with straps.

In antigropelos the back portion from the calf downwards is made of the fabric, and a piece of the same fabric is inserted as in the jockey boot.

In high shoes the front of the upper (or a part only thereof) is made of the elastic fabric; the hinder parts are of ordinary or inelastic leather.

In ladies' boots the back and part of the front (or only part of the back and front) are made of the elastic material, and it is preferred to use "elastic woven fabric."

[Printed, 10d. Drawings.]

A.D. 1853, January 25.—No. 184.

OVANS, THOMAS.—(*Complete Specification, but no Letters Patent.*)—"Improvements in the manufacture of boots." The inventor dispenses "with any necessity for buttons or lacing" and ensures "a tight though easy fit to the foot" by the application of elastic web, corrugated elastic leather, or other material possessing like elastic qualities, to that part of boots which covers the instep. The elastic extends "in front from" the toe leather to above the instep and backwards on each "side as far as may be found convenient;" it is used "in" lieu of leather or cloth as heretofore in use," and must be "of such width as to admit when expanded of the free ingress" and egress of the foot."

[Printed, 4d. No Drawings.]

A.D. 1853, January 31.—No. 244.

KNOX, THOMAS.—“A new or improved rotatory heel for “boots and shoes.” The rotatory part of the heel is composed of (1) a ring of brass or other metal; (2) a smaller ring of metal placed within the larger ring and having its edge turned over the edge of the larger ring so that the latter may rotate upon the former; (3) a disc of leather placed in the smaller ring; (4) an annular piece of leather placed on the larger ring and screwed or otherwise fastened thereto; (5) a disc of leather having a “cavity or cup formed in its middle” and fastened to the annular piece by nails or otherwise.

The foregoing parts are secured to the fixed portion of the heel by nails or screws which pass through the disc in the smaller ring and through holes pierced through the smaller ring. The outer or larger ring, the annular piece of leather, and the bottom disc, “are thus capable of a rotating motion” on the smaller ring. The rotating parts “require the application of considerable force to effect their motion” and consequently “are not liable to move during the wearing of “the boot or shoe.”

[Printed, 6d. Drawing and Woodcuts.]

A.D. 1853, February 2.—No. 289.

PAINE, THOMAS. — (*Provisional protection only.*)—“Improvements in heels for boots, shoes, and other coverings “for the feet.” The heels are made of horn, which after being heated is pressed into moulds of the required form. The heel is attached by screwing it on to a ring, “which is “retained by a collar or flange inside a second and larger ring sewn or otherwise attached to the boot or shoe.” The heel may be either a fixture or rotatory by the smaller ring “turning in the larger ring.”

[Printed, 4d. No Drawings.]

A.D. 1853, February 3.—No. 296.

DULAURIER, BENOIT.—(*Provisional protection only.*)—“A new system to render boots and shoes waterproof without “sewing or nailing whatever; and the said invention to be “applied also to render waterproof hats, caps, and general

“hatting; my invention consists also in the application of machines to the manufacturing of general shoemaking and hatting.” The inventor uses three compositions, the first of caoutchouc and gutta percha melted separately and then mixed together; the second of purified asphalte and marine glue; the third “of Monsieur de Coulène’s putty.”

He briefly describes his method of treating boots and shoes when on their trees or lasts “they are placed in their respective screws only used for that purpose, and afterwards by means of levers the uppers are strongly pressed on their trees or lasts with the matrixes.” When the nails are taken out, “the soles are covered with glue,” and “the complete finishing of the adhesion of the uppers” is obtained by aid of other levers.

[Printed, 4d. No Drawings.]

A.D. 1853, February 4.—No. 311.

EDGAR, WILLIAM.—(*Provisional protection only.*)—“An improved boot, particularly suitable for the use of emigrants and persons at sea.” These boots are made with “an outer covering of leather extending above the ankle or further up the leg of the boot, even to the top if required.”

Or the outer covering of leather may extend just above the ankle, and the remainder upwards be of sheet india-rubber or waterproof fabric. All the seams are to be well secured and waterproofed. Elastic gussets may be let into the leather part at or near the ankles.

[Printed, 4d. No Drawings.]

A.D. 1853, February 21.—No. 442.

PIDDING, WILLIAM.—“Improvements in coverings for the feet of bipeds or quadrupeds.” This invention relates principally to the manufacture of soles for boots and shoes. The sole is made hollow, of india-rubber or gutta percha; it is filled with liquid (by preference oil), and when required to be of very light weight with air.

The sole-casing is kept in shape “by sewing throughout its surfaces numerous india-rubber threads” in either a straight or a slanting direction. The liquid or air is prevented from escaping where the threads are sewn by coating the top and

bottom of the casing several times with solution of india-rubber or the like.

For forming the casing a mould is used ; it is composed of several parts which when fitted together represent the required shape ; the parts "are to be drawn out one by one, when the casing is complete, either at the toe or heel end." The casing consists of "several layers of tape or ribbon made from caoutchouc ;" when completely formed, it is boiled in water, "having previously secured the end of the caoutchouc" "tape used by common tape or other fastening."

Although these soles are thicker in bulk, they will be about "one tenth the weight of ordinary soles."

The uppers may be of any suitable material ; they are cemented to the soles.

[Printed, 6d. Drawing.]

A.D. 1853, March 3.—No. 542.

CRICK, THOMAS.—"Improvements in the manufacture of boots, shoes, clogs, and slippers." The uppers and the soles are united by tacks, rivets, or springs, "the heads being on the interior."

The last employed is of metal or of wood bound with metal. The upper is placed on the last "inside out." The sole is fixed to the bottom of the last by driving one or two nails through it into the bottom, which if of metal "is to have wood at the middle of the under part to receive such nails." The edges of the upper are fixed by driving tacks, &c. through the upper and the sole ; the points coming against the metal will be clenched ; the last is removed (the middle nails having been taken out) and the boot or shoe "is to be turned right side out, as is well understood." If a heel or an additional sole is to be added, it is pegged or sewn to the sole already affixed. The boot or shoe "is to have the interior of the sole added to make it level with the interior edges of the upper, and a lining is to be pasted thereon."

[Printed, 8d. Drawing.]

A.D. 1853, March 4.—No. 547.

HALL, JOSEPH SPARKES.—"Improvements in cutting out parts of boots and shoes." These parts are cut out by means

of cutting tools or dies of steel or other metal and a press. The tools are "formed agreeably to improved patterns," and so arranged that "by a combination of two or more patterns" the patentee effects "a great saving of material and time." He usually combines "three different forms and sizes in one "cutter" and occasionally welds together three of these tools. He places the leather on the table of the press and brings down pressure on the cutting tools.

One figure in the sheet of drawings represents a pair of cutters so combined as to stamp out "a man's golosh" and "a cap or toe piece for a child's shoe;" another a cutter for stamping out three shapes, namely "the cap for a woman's shoe," "a woman's low golosh," and "a similar shape but of a larger size;" another for stamping out "the back for a woman's boot or shoe," "a child's cap," and "the front of a woman's shoe;" and another for stamping out "two soles of a boot or shoe at one and the same operation."

[Printed, 6d. Drawing.]

A.D. 1853, March 9.—No. 598.

PIDDING, WILLIAM.—"Improvements in treating sheets of "caoutchouc or gutta percha, so as to render the same fit for "ornamental coverings," namely, "for covering shoes, boots, "ottomans, carpets, ornamental hangings," &c.

A sheet of caoutchouc is stretched to from eight to sixteen times its original superfiice, and a design is printed thereon showing on its surface "equi-distant dots, or dots printed "according to the design." Each of the dots is perforated, and into each perforation is introduced a stud of suitable size and shape and of any desired material. On allowing the sheet to collapse, it will present "a surface of glass, steel, or other "coloured substances." Closer adhesion of the caoutchouc and ornaments may be obtained "by boiling the fabric in water." Threads, soaked in gelatine or other adhesive matter, dried, and cut into suitable lengths, may be used instead of studs, the adhesive matter being afterwards removed by proper solvents.

"Uncut pile" may be produced on an india-rubber ground by distending a sheet, passing it between grooved rollers and then between rollers carrying adhesive matter in solution, applying to it "threads, yarns, spun glass, or other sub-
"stances," and removing the superfluous solution or moisture

when the whole is thoroughly united by pressure. "When the india-rubber contracts, the fabric will be an uncut pile on one or both sides thereof."

[Printed, 4d. No Drawings.]

A.D. 1853, March 29.—No. 757.

BERNARD, JULIAN.—"Improvements in boots, shoes, and clogs, and in the machinery or apparatus and materials connected therewith." 1. Mechanical arrangement for inserting screws, pegs, or similar fastenings, into the soles and heels:—The last with its accompaniments is fixed in a frame which is caused to traverse in a course corresponding with the curves of the sole and the angles at which the fastenings are to be inserted. In another part of the machine and "over or opposite the sole" are "a piercer, pliers (or hollow spindle), a shear, a revolving file, and a hammer," arranged "segmentally in a suitable frame;" each instrument is brought in succession over the portion about to be screwed or pegged. A rotary movement or a vertical movement is imparted to such of the instruments as require either or both, and above this mechanism and working in conjunction with it is a wheel (one or more) receiving "intermittent movement." The wheel "works horizontally over the hollow spindle or pliers," and has in it as many holes as there are screws or pegs to be inserted. The holes (supplied each with a screw or peg) are brought in succession over the spindle or pliers. A spring, projecting "underneath the extremity of the spindle," prevents the peg, &c. "from falling entirely through" but allows as much to protrude as is to be inserted. On the spindle is a collar which rises and falls; by its rising, "the conical end of the spindle will be contracted" and hold the peg, &c. securely. When a hole has been made in the sole or heel by the piercer, the spindle is brought directly over the hole; "the collar and spindle now descend simultaneously, and in their descent force aside the spring and insert the fastening."

When a screw is used, the spindle makes "the requisite number of revolutions to effect its insertion;" the collar descends, "causing the nipper or plier to release the head of the screw;" the collar and spindle ascend, "and the shear coming into action effectually cuts off the protruding head."

The head cut off is conveyed away by either a blast of air or a spring. The file is next brought into action, and after it the hammer. The patentee proposes to use pegs of cured gutta percha and with them a glue or cement; this is put into a hollow spindle having a bore smaller at the end next the sole. This spindle is situate in the instrument-carrying frame; it is brought directly over the hole made by the piercer, and a sufficient quantity of its contents is ejected by means of a valve and pump. The glue or cement may be heated by a steam jacket around the spindle.

If soles and heels are fastened on with cement, the last (with the sole, &c. thereon) "is put underneath the piston of a press" and subjected to pressure."

2. "Hammering or beating" the leather used for soles and heels:—Hammers mounted in a framing are actuated by cams and springs or "by the direct action of steam;" they are arranged obliquely in bearings "so that the portion of the "leather beat by the edges of each hammer is made to come "underneath the next hammer to it."

3. Thinning or bevelling soles or heels at any particular part:—The sole or heel is laid over a "die raised above the "surface of the table on which it is placed;" the surface of the die is convex. A hinged piece, connected to the table and formed with a hole corresponding in shape to the die, but somewhat smaller, is brought down on to the die; it presses the edges of the leather, allowing the middle portion to protrude above the hole. The workman "removes the protruding "portions of the sole or heel with the cut of a knife." If the edges are to be bevelled or thinned, the hinged piece is made to press on the middle of the leather.

4. Steam is introduced into various tools used in the manufacture of boots and shoes for the purpose of heating the said tools.

5. Boots and shoes are dried by means of heated air or steam in chambers or compartments suitable for such purpose.

6. "Treating the counters of boots and shoes and securing "them to the other parts:—Pieces "made to taper towards "the centre" are placed upon the inner sole; they may have in their outer edges "curves or undulations" increasing in depth "towards the top of such pieces." The heel also is made with like curves. The counter, stiffener, and lining are

placed between the pieces, and the heel and inner sole are secured together. Plastic material, such as gutta percha, is used to form the piece "immediately over the inner sole and "beneath the counter and other parts referred to."

7. Wood charged with gutta percha or caoutchouc is used for the heels of boots and shoes and for the soles and heels of clogs; such heels and soles are attached with plastic material.

8. Soles, uppers, and other parts of boots and shoes are cut out by the aid of two rollers; on the one are fixed suitable dies or projections; in the other are cut corresponding apertures.

9. "A die and spring" are placed inside the punches or knives used for cutting out parts of boots and shoes for the purpose of "ornamenting such parts" and at the same time "protecting the cutting edges from injury."

The apparatuses required for effecting the various heads of the invention and modifications of some and of some of the methods described are detailed in the Specification.

[Printed, 1s. Drawings.]

A.D. 1853, April 14.—No. 906.

DUNCAN, JOHN WALLACE.—"Combinations of gutta percha "with other materials, and the method of applying such for "use." The ingredients of the cement which constitutes this invention are some of the following:—Gutta percha or gum madder, caoutchouc, shellac, Canada balsam, Venice turpentine, balsam "from the liquid amber styraciflua or styrax," gum mastic, oxide of lead, pitch, caseum, gluten, coagulated linseed oil, and gum ammoniacum.

A cement for uniting sheet gutta percha to leather, "as for "shoe soles," consists of 50 parts of gutta percha, 40 of Venice turpentine, 4 of shellac, 1 of caoutchouc, and 5 of styrax.

A cement for joining leather is composed of 60 parts of gutta percha, 10 of shellac, 2 of caoutchouc, 20 of Venice turpentine, and 8 of styrax.

To unite small articles of material, "such as leather shavings, "silk waste, hair, and the like," a cement is made from 20 parts of caseum, 15 of gluten, 5 of coagulated linseed oil, 1 of oxide of lead, 25 of Venice turpentine, and 34 of gutta percha; about 8 per cent. of gum ammoniacum may be substituted with advantage for "a like portion of the gluten."

"The above proportions may be varied."

In compounding the cements the balsams are heated "to the requisite degree for dissolving the harder gums." The gums when dissolved "are then put into a machine with the gutta percha, also heated, and the other component parts." The whole "is thoroughly amalgamated by mastication," and is expressed from the machine in a state suitable for use.

If caseum or gluten forms part of the cement, it is preferable "to combine such matters in the masticating machine with the balsams alone without heat," and then to introduce the gutta percha "in a heated plastic state."

In the annexed sheets of drawings are represented (*inter alia*) (1) an apparatus for combining and masticating the compounds and for "applying the cements to the several substances required"; (2) a machine "for the manufacture of tubes or sheets of different plastic materials"; (3) a machine "for manufacturing sheets of plastic materials in laminæ"; (4) a machine, by which "the cement may be applied to paper, sheet metal, or suitable textile fabric, or other material, by uniting such in the form of round, angular, or other formed tubes, which may be cut into lengths for hat bodies, cases, boxes, and other articles."

[Printed, 1s. Drawings.]

A.D. 1853, April 19.—No. 946.

DAY, THOMAS.—"Improvements in the manufacture of boots and shoes, whereby great ease is secured to the wearer." This invention is more applicable to boots than to shoes unless the shoes are required to come high over the instep. It consists in introducing a piece of elastic into the part known as the waist, thereby securing "facility in putting on and ease and comfort in wearing."

The piece may be let in on both sides; one side however will generally be found sufficient, and it is preferred that it should be let in on the inner side. The best mode of fixing the piece is to secure it at the bottom between the welt and insole for men's wear, and between the insole and outer sole for women's wear, and to stitch it neatly to the front and back of the boot.

[Printed, 6d. Drawing.]

A.D. 1853, May 14.—No. 1195.

POOLE, MOSES.—(*A communication from Edward L. Norfolk.*)—"A new or improved machine for pegging boots or "shoes." The principal parts are machinery for (1) supporting the boot or shoe and "moving it under the pegging "mechanism;" (2) sustaining the pegging mechanism and regulating the direction of the pegging awl so that "it shall "pass into the sole at the proper angle under any change in "the curvature of the sole;" (3) operating the pegging awl and driver; (4) sustaining the pegwood and "forcing it for-"wards towards the shoe;" (5) splitting the pegs from the pegwood; (6) operating the charger that contains the pegwood.

The last is fixed on two uprights carried by a carriage which moves on two curved rails; one upright has one or more pins which enter the hinder part of the last, the other a screw which is screwed into the toe part and acts against a saddle.

The main driving shaft at one end of the frame of the machine is geared to a similar shaft at the other end, so that each makes the same number of revolutions in the same length of time.

There are two similar sets of pegging mechanism; each effects the pegging "from the middle of the heel to the middle "of the toe." Each is carried in a frame and connected to one of the shafts. "A rocker frame" allows "free vertical as "well as other movements" to each frame "so that it may "be guided in its vertical movement by the curvature of the "upper surface of the sole" and "horizontally" by a cam wheel.

The awl and driver are combined "with one carrier," and "they are alternately presented or brought down, against, or "towards the sole." During one movement of the carrier the awl descends and presses into the sole, and during the next the driver descends upon a peg.

Each peg is placed in one compartment of a charger frame which slides "freely in transverse directions in a supporting "frame." A piston or slide works through the latter frame and into some one of the compartments, and each peg is pressed forwards by the lower arm of a spring lever.

Each strip of pegwood is "serrated at bottom" so that each peg may have a pointed end. A knife separates a peg from

the strip; a guide catches the peg between it and the knife; the guide "is drawn downwards below the peg and springs "towards and against the knife and is thrown upwards "between the peg and the knife;" the guide and knife "are "brought down to their lowest position so as to bring the top "edge of the knife a short distance below that of the guide;" at their upward movement the guide strikes against the end of the wood and guides the knife into the next serration.

The charger is operated upon by a spring, a rack, a pawl, and a spring applied to the upright part of the pawl.

The whole of the machinery is explained at length in the Specification.

[Printed, 1s. 2d. Drawings.]

A.D. 1853, May 16.—No. 1206.

JAMIN, JEAN JACQUES JOSEPH, and SYMONS, ALEXANDER.—
"Improvements in the manufacture of boots and shoes." The soles are made wholly or partly of wood. When wholly of wood, a groove is cut "in and around the edges," and the edges of the upper leather are put into the groove. A narrow strip of leather also is put into the groove; its width must be sufficient to allow one half "to lie under the edge or margin "of the upper leather" so as to be secured by sprigs or tacks, and the other half to be "doubled over the side of the margin "of the upper leather and there fixed so as to conceal the "sprigs or other fastenings." There is usually a joint between the heel and fore part of the sole; it is "secured by "a piece of india-rubber or other suitable material attached "to the under side;" another piece may be "let in" on the upper side.

Or the upper leather may be cut large enough for the lower edge to be turned over and project outwards to the same extent as the strip before-mentioned; the projecting portion answers the purpose of the strip.

Some wooden soles have cemented to their upper side a leather which serves as a lining and to their under side a sole of leather; this under sole is "doubled up all round so as to "conceal the edges of the wooden soles and also the fastenings which secure the upper leathers."

[Printed, 8d. Drawing.]

A.D. 1853, May 20.—No. 1250.

GILBERT, HENRY.—(*Provisional protection only.*)—"Improvements in apparatus for cleaning boots and shoes." This invention consists in combining rotatory brushes with a suitable axle and giving motion thereto by means of a treadle.

[Printed, 4d. No Drawings.]

A.D. 1853, May 21.—No. 1260.

SCOUTETTEN, HENRI JOSEPH.—"An improved plastic compound applicable to various ornamental and useful purposes," among which are mentioned boot-soles and straps. The compound consists of asphalte 10 parts, caoutchouc 10 parts, gutta percha 8 parts, turpentine 1 part, zinc white 4 parts, gum lac 2 parts, wax 2 parts, and oxide of iron, sulphur of antimony, ultramarine, chrome yellow, or other metallic oxides, to colour the compound or to give it solidity. The number and quantity of the ingredients vary according to the purpose for which the compound is required.

The apparatus required for making the compound consists of two steam-heated revolving cylinders (which "crush the substances which enter into the composition of the paste and form a homogeneous mass") and double-bottomed cauldrons (heated by steam) to "receive the matter, which according to circumstances may be heated dry or in hot water."

Directions for making the compound:—Melt the asphalte; dissolve the caoutchouc in turpentine; mix the two, work them up, and pass the mixture between the cylinders; add the gutta percha, then the turpentine and gum lac; mix them well together "by passing them frequently under the cylinders;" add the oxides according to the colour required. No directions are given for adding the other ingredients.

The compound may be made chemically by dissolving "gutta percha, caoutchouc, and pitch" in "sulphuret of carbon," purifying the solution, and drawing off the sulphuret. "A mass is obtained which may be heated dry in close vessels."

For the manufacture of boot-soles and straps "carded cotton" is saturated and coated with the compound, purified,

“ heated dry,” and passed between rollers; it is then put into moulds or compressed into shape.

[Printed, 4d. No Drawings.]

A. D. 1853, June 2.—No. 1360.

NEWTON, WILLIAM EDWARD.—(*A communication.*)—“ Improvements in the manufacture of soles for boots, shoes, and other coverings for the feet.” These soles are made of india-rubber or gutta percha, and the novelty consists in moulding the entire sole, namely fore part, shank, and heel, by a single operation. The apparatus required is composed mainly of two rollers heated by steam or other means and gearing into each other. The upper roller has a smooth surface and revolves in fixed bearings. The bearings of the lower roller are “ moveable and adjustable,” and on its surface are patterns or moulds “ into which the material is pressed and at the same moment cut or moulded in the shape of the sole by the pressure ” of the smooth roller and the edge of the moulds.

“ A continuous sheet of soleing ” is formed by passing the material between the surfaces of a smooth roller and another “ divided into three different parts or peripheries of greater or less diameter, leaving as it passes between them thicknesses in the soleing of more or less depth,” corresponding to that required for the fore part, the shank, and the heel. The sheet passes from these rollers between two others, on one of which “ are raised moulds or patterns of the outline of the sole; ” these moulds are made to impinge against the surface of the other roller, “ thus forming by the pressure a cutting or moulding edge and making the sole.”

The sole may be made also “ by other arrangements of moulds and rollers.”

A channel or smooth space on the outside of the fore part and heel is “ an important improvement in the sole; ” it improves the appearance and gives a firm foot-hold to the sole; it may be flush with the surface, or raised above, or sunk below.

The patentee claims also the making of “ openings for channels in the mould, through which a connection is left between the plastic material in the mould and the sheet,

"and by which the sole may be withdrawn from the pattern
"or mould."

[Printed, *sd.* Drawing.]

A.D. 1853, June 29.—No. 1564.

IRONS, THOMAS EDWARD. — "Improvements in the manufacture of lasts, and in machinery connected therewith, parts of which machinery are also applicable to other like purposes of eccentric turning." The improvements consist (1) in so arranging the machinery that "right and left foot lasts" can be cut from the same pattern at the same time; (2) "in substituting a circular cut in the front of block lasts for the usual straight or square cut," so that the block "makes its own fastening without requiring a pin to hold it when in use;" (3) in an arrangement for polishing the lasts by means of endless bands covered with glass or emery.

The lathe employed is composed of (1) two headstocks; (2) chucks; (3) a centre spindle carrying a cog wheel working in a pinion and operated on by another cog wheel; (4) a rocking bed driven by a shaft carrying a cog wheel, motion being given by bands which pass over "regulating cones;" (5) a revolving guide; (6) "a screw or coupled screws" carrying two cutters which are worked by pulleys, drums, and bands; (7) a sliding bed whereon the beds of the cutters and guide move; (8) driving pulleys mounted on a shaft.

One of the screws is cut with a right hand thread, the other with a left-hand thread. The cutters "slide towards each other and meet midway." The guide is "connected to the second of these cutters by a plate on the top of the chairs" of the guide and cutter; "it traverses the same way," and consequently the last made by this cutter will be "a right foot last" and "contrarywise with the first cutter," thus "making from one piece of timber and from one pattern a pair of lasts at the same time."

Or two lasts may be cut from two pieces of wood at the same time "by placing a suitable headstock between two pieces of wood, causing the two to be turned from one pattern."

The outer surface of the endless bands is covered with glass or emery, and the lasts are polished by pressure against it whilst the bands are rotating rapidly.

[Printed, *sd.* Drawings.]

A.D. 1853, July 16.—No. 1705.

DUNCAN, JOHN WALLACE. — “Improvements in adhesive
“soles and heels for boots and shoes, and in apparatus used
“for preparing and applying the same.” These soles and
heels are made either of a cement for which letters patent
were granted to Mr. Duncan, bearing date April 14th, 1853,
No. 906, or of “leather of any suitable description, gutta
“percha, caoutchouc, cattimundo, gum muddar, or other
“compounds (in any condition of treatment) either alone or
“combined with fibrous materials, textile or woven fabrics,
“cork, wood, horn, metals, glass, or earthenware;” they are
fastened on by means of an adhesive surface of waterproof
cement.

Some soles are perforated, and vulcanized gutta percha or
caoutchouc protrudes through the perforations so that “the
“weight of the wearer may be sustained upon the elastic
“portion.”

In some soles and heels durability is increased by inserting
studs through one or more thicknesses of material “prior to
“application.”

All soles and heels “of a close substance” are perforated
to allow the escape of air or superfluous cement when attach-
ing them to uppers.

The patentee claims also :—

1. The manufacture of goloshes consisting of a sole “to
“encase the lower part of the boot or shoe” and a vamp
“formed all round the entire sole, rising from the edge,” and
“contracted all round the top so as to incline towards the
“middle.” These articles are made in moulds.

2. An apparatus “for holding and keeping cool gutta
“percha or adhesive soles while being heated :”—He uses
“a chamber or flat vessel with a raised flange or edge forming
“a recess in the side of the chamber in which the sole rests ;”
this chamber is filled with cold water “to keep that part of
“the sole cool which is not exposed” to the heat.

3. An instrument “for clearing the bottoms of the boots
“and shoes preparatory to the application of adhesive soles :”—
—A brush or scraper is made “by inserting sharp-pointed
“steel pins into a metal head or wooden handle.”

[Printed, &c. No Drawings.]

A.D. 1853, July 28.—No. 1771.

FORSTER, THOMAS.—“Improvements in the manufacture of “boots and shoes.” The first part of this invention relates to the method of making boots to be used “when fishing or “otherwise when the wearer is liable to walk in water.” The lining is of sheet india-rubber about $\frac{1}{16}$ th of an inch thick or of fabric coated with india-rubber or its compounds. The seams in the leg are cemented together; the foot is blocked on a last; the lining is cemented to a shaped insole of india-rubber not less than $\frac{1}{4}$ th of an inch thick; a linen or cotton fabric is cemented over the lining “to give strength and prevent undue elasticity;” a cover of sheet india-rubber (coloured black or otherwise) is put on; and, finally, a golosh and a sole of leather are applied “as usual in the manufacture “of ordinary india-rubber boots.” The lining can be vulcanized if required before putting on the fabric; or the whole may be vulcanized before putting on the leather golosh and sole.

The second part treats of the manufacture of boots and shoes having an interior of india-rubber or its compounds and an exterior of leather or “fabric with or without a golosh of “leather suitable for ladies’ wear.” The lining is blocked on the last; a leather insole is cemented to the lining; the leather upper blocked to shape is cemented to the lining, “having “one join up the back which must be neatly closed;” the welt is sewn-on; and the boot or shoe is finished in the ordinary manner.

“No nails must be used in fixing the work.”

“Variations in the modes of carrying-out this invention may “be resorted to.”

[Printed, 6d. Drawing.]

A.D. 1853, August 13.—No. 1900.

GWYNNE, JOHN.—“Improvements in the preparation of a “black powder from coal, and in the applications thereof to “the manufacture of paints, blacking, and various other “purposes.” The patentee employs, in place of lamp black or other colouring substances now used in the manufacture of paints, blacking, &c., “coal in any of its varieties and modifi-

“cations,” but by preference “the coal or fuel known as Gwynne’s patent solidified peat or coal.” He grinds the coal in mills or by other means, puts it through “the requisite washings” and “the subsequent dryings,” and then reduces “as nearly as practicable to a finely pulverized condition according to the known methods of such processes.”

He obtains the fine or impalpable powder by either a “dry method” or a “wet process,” and he describes each “rather as a mode of elucidating the manner of treatment” than as confining himself to either method.

[Printed, 4d. No Drawings.]

A.D. 1853, August 13.—No. 1905.

SCOTT, EDWARD JOHN.—(*Provisional protection only.*)—“Improvements in the manufacture of boots and shoes.” The soles (of leather) are shaped by means of punches or cutters; they are laid on metal-faced lasts having the uppers and insoles in position, and are fastened-on with copper or other rivets. Before the workman inserts the rivets, he “runs a perforating wheel or spurred disc round the line of the intended row.” The rivets are wedge-shaped; the pointed ends are clenched inside against the metal face, whilst the blunt ends fix securely into the exterior of the sole.

The outer sole may be riveted directly to the upper, or a layer of fibrous substance saturated with waterproof solution may be laid-in between the two surfaces to make a tight joint.”

[Printed, 4d. No Drawings.]

A.D. 1853, September 5.—No. 2041.

DOYLE, JOHN.—(*Provisional protection only.*)—“Waterproofing of boots and shoes.” A solution or paste is applied “to the inner coat of the upper leather and a lining to the same.” A solution or paste is applied also “between the inner and outer soles.” The outer sole is fixed to the welt “by means of adhesion instead of stitches;” this part of the invention is claimed “from its greater simplicity and economy to the manufacture of boots and shoes generally.”

[Printed, 4d. No Drawings.]

A.D. 1853, September 20.—No. 2182.

STOCKIL, WILLIAM.—“A new or improved method of blocking leather used in the manufacture of boots.” The machine used is of the following description:—Two uprights are connected at top and bottom by cross pieces. “Four cast-iron angular cheeks” are bolted in pairs to the standards, and two plates are bolted to the cheeks. “Four shoe pieces” of non-corrosive metal “cover and so form an inside face to each of the angular cheeks;” pieces of india-rubber are interposed between these pieces and the cheeks. A series of projections or ribs of non-corrosive metal and of angular shape are “superposed the one above the other and connected to the plates” by screws “which are passed through the plates and tapped into the back of the ribs.” The ribs are thus “capable of being so adjusted as to leave sufficient vertical space between the two sets of ribs for the passage of the blocking knife and leather, a similar space being left between the top and bottom pairs of shoe pieces.” Two sheets of vulcanized india-rubber which act as springs are placed between the ribs and the plates, whereby the ribs “are kept out to the full extent allowed by the screws,” but at the same time “are capable of yielding to the varying thickness of the leather passing between them.” The blocking knife is drawn down between the cheeks; it is made with two projecting ends which fit into “recesses in the back of two vertical racks” sliding up and down in the standards when actuated by pinions on a revolving shaft. The shaft is in gear with a crank handle, and carries a wheel round which a weighted cord is wound for drawing up the racks again.

The leather is laid evenly upon the top of the shoe pieces immediately under the knife, so that when the knife descends “it shall fold the leather as near as may be down the centre.” The workman turns the handle, causing the leather and knife to pass between the shoe pieces and ribs, “whereby the leather has imparted to it permanently the shape of the intended boot front.”

[Printed, &c. Drawing.]

A.D. 1853, October 25.—No. 2466.

GOODYEAR, CHARLES.—“Improvements in the manufacture of boots and shoes.” The object of this invention is “to

“ obtain better ventilation to the interior of a boot or shoe.”

The heel has “a central elastic tread” (by preference) of vulcanized india-rubber; it is hollow and within it is one end of “a tubular valve” which extends to the sole. The end which comes into the heel is flat “so that the surfaces thereof come together and so remain unless air is forced through from the fore part of the sole.” The tube has within it, except at the flat portion, a wire spring to keep it open. At the back of the heel is placed a similar tube valve; it is carried to any desired height above the heel, and its upper end is flattened.

The sole also is made with a central elastic tread. The insole is perforated with numerous holes. The central portion of the outer sole is removed for the admission of the elastic tread. The edges of the treads for sole and heel are “strengthened with fabric before vulcanizing,” and the various parts of the boot or shoe are sewn together. Pieces of leather are “fixed on the inside of the sole and the heel in order to prevent the spreading of those parts, which they would be otherwise liable to do by reason of the central portions of the outsole and of the heel being removed.”

[Printed, 8d. Drawing.]

A.D. 1853, October 26.—No. 2473.

HUGHES, EDWARD JOSEPH.—(*A communication.*)—“Improvements in machinery or apparatus for sewing or stitching.” The inventor claims the following improvements in his sewing machines; (1) the use of two straight needles working diagonally; (2) the use of a straight needle working vertically with a hooked needle or guide acting upon the thread or threads horizontally; (3) the use of two straight needles, one working vertically and the other horizontally; (4) an improvement which belongs especially to the present series, namely, the use of clamps for “the operation technically called closing,” or the sewing together “the legs of boots, the upper parts of shoes,” &c.

A rack is fitted in a groove in the upper part of the table and near the needle in such a manner that it may have “a longitudinal motion.” The teeth of the rack work in the teeth of a pinion “which gives the necessary motion for each

"stitch," and motion is given to the pinion from the main shaft by means of "a cam lever and ratchet gear or similar contrivance." In one end of the rack is a stud whereon is fitted one end of the lower part of the clamp so that it will turn on the stud. A spring fastened to this part of the clamp passes "upon a small projection" thereon and extends "through the upper part of the clamp," thereby causing the two parts "to press forcibly together" when the material to be sewed is placed between them. On the other end of the lower part is fastened a stud which extends upwards through an elongated hole in the upper part; the stud is screw-threaded, and an elongated screw nut forces the parts together, or when placed lengthwise of the clamp allows the work to be removed. The clamp, so shaped that "the seam may be sewed close to the edge" thereof, is guided on one side by a projection on the top of the table, and on the other either by hand or by a stud or roller.

The clamp may be made of two curved springs "having the convex sides together with one end of each secured to the other by an adjustable screw," and the other ends held by a spring catch. This clamp is "held and guided by the hand," and the material is fed along by means of any "suitable feed motion." The inner sides of the clamps are grooved.

[Printed, 10d. Drawing.]

A.D. 1853, December 30.—No. 3025.

SWIRE, BENJAMIN.—(*Provisional protection only*).—"Improvements in machinery or apparatus for making metal tips for shoes and clogs." The inventor bends pieces of metal into the required shapes by means of a vibrating lever provided with bending tools, which "advance towards dies" whereon the pieces are placed. As the extent of the vibrating motion will vary according to the distance from the centre, the pieces may be bent into "shapes of different corresponding sizes." With the vibrating machine is combined "an apparatus at the driving shaft thereof for turning severed pieces of metal into the aforesaid shapes." Shears for cutting off lengths of metal are attached to the lever.

[Printed, 4d. No Drawings.]

A.D. 1853, December 31.—No. 3045.

SOREL, STANISLAS TRANQUILLE MODESTE.—“Compositions to be employed as substitutes for caoutchouc, gutta percha, and certain fatty bodies.” These compositions are applicable for many purposes; with the aid of some the patentee makes “double sheets” for the upper leathers of waterproof boots and shoes, with others he waterproofs the outer soles and certain uppers.

“The principal bases” of the former are “colophony or common resin, bitumen or natural pitch or the pitch obtained from gas works, fixed resin oils, gutta percha, hydrated lime, and water;” other ingredients mentioned are pipe clay or other argillaceous earths, natural or vulcanized caoutchouc cut up into small pieces, and about 5 per cent. of beeswax or stearic acid. Other ingredients may be used instead of some of the foregoing, and “smoke black or other colouring matters” may be added. Tenacity is increased by the addition of fibrous materials and leather waste. The composition is rolled into sheets and “lined or covered with thin sheets of natural or vulcanized caoutchouc” by means of a rolling machine or some adhesive agent.

Uppers (made of thick cloth or stuff) and soles of leather are waterproofed by means of a preparation “composed of beeswax or stearic acid dissolved in turpentine or other analogous solvent,” or by means of insoluble soap made (by preference) of water 60 parts, soft or hard alkaline soap 6 parts, beeswax 2 parts, stearic acid 1 part, and a small quantity of pitch and resin.

The following composition is found to answer well for rendering leather waterproof, “especially strong leather employed for soles of boots and shoes:”—Colophony 12 parts, fixed resin oil 4 parts, yellow beeswax 2 parts, and tallow 2 parts.

Directions for making the compositions and an apparatus (preferred by the patentee) for applying them, as well as the substitutes for some of the ingredients named, will be found in the Specification.

[Printed, 4d. No Drawings.]

1854.

A.D. 1854, January 3.—No. 17.

BERNARD, JULIAN.—“Improvements in the manufacture of “boots and shoes, part of such improvements being applicable to the manufacture of garments.” The first improvement relates to “modes of securing the uppers or fronts to “the soles or bottoms of boots and shoes.”

First mode :—The welt is stitched to a single sole ; the upper is stitched to the welt, and the boot or shoe is then “reversed “in the ordinary manner.”

Second mode :—The welt is formed “by splitting the sole “all round and turning up such split portion ;” the upper is stitched to the welt, and the boot or shoe is then turned. Or the upper can be stitched to the welt without turning the boot or shoe. “Such stitching will not show” when “the edges “are well pressed down.”

Third mode :—The upper with a welt attached to it is put on a last carrying an insole ; the edge of the upper is turned over and cemented to the insole ; the outer sole is then “secured “to the other parts by means of the welt.”

Fourth mode :—“A finished or ornamental appearance” is given to boots and shoes “by turning over the welts” so as to form “a species of binding on the edge of the inner sole ;” the welts are wider than usual and are previously secured to the uppers.

The second improvement relates to “modes of cutting the “various parts and materials of which boots and shoes and “garments are composed.”

First arrangement :—Two spindles work in “bearings geared “together one underneath and one above a table.” Each spindle carries a shear-edged disc revolving in contrary directions and so placed as to cause their edges to come into contact with and slightly overlap each other. The material “is “presented to the revolving cutters, which cut the material “in any desired direction.” The discs may revolve at different speeds, or at the same speed ; one of them may be stationary.

Second arrangement :—The cutter is an endless band of steel “passed round three drums, one above, one below, and

“ another at the end of a table, or otherwise suitably placed.” The band “ passes vertically through a slot in the table and is supported immediately behind the cutting point by means of a small steel roller.” One of the drums is capable of adjustment so as to tighten the band. The cutting edge may be smooth or serrated ; in the former case a stone or other appliance for sharpening it may be arranged to come into contact with it as it revolves ; “ the same means may be applied also to the revolving disc,” or discs in the first arrangement.

[Printed, 1s. Drawings.]

A.D. 1854, January 16.—No. 104.

SPIRES, JOSEPH.—(*Provisional protection only.*)—“ Improvements applicable to boots and shoes.” The improvements consist of “ an improved construction of rotary heel,” and an instrument for “ causing it to rotate on its centre when required.”

The heel is composed of (1) a circular metal plate screwed or otherwise fixed to the boot heel ; (2) a concentric metal ring or tip surrounding the plate and held in place by a shoulder so that it may be made to rotate when required ; (3) a block of wood or thicknesses of leather to fill up the centre of the ring.

Or it may be composed of a moveable central metal piece held in place by a “ thin concentric ring,” which is screwed or otherwise fixed to the boot heel. The filling piece must be attached to the moveable piece.

The instrument is either “ a spring clamp,” the jaws of which will embrace the heel and enable any one to turn it, or a clamp provided inside with one or more studs which take into notches in the periphery of the metal ring or other part of the heel.

[Printed, 4d. No Drawings.]

A.D. 1854, January 17.—No. 112.

WEBER, KARL.—(*Provisional protection only.*)—“ Improvements in the manufacture of boots and shoes.” The upper leathers and soles are fastened together “ entirely by wooden pegs without any employment of thread.” The uppers are to be cut of sufficient size to allow their edges

“to be doubled down upon the soles of the boots or shoes
 “so as to meet or nearly to meet in the centre, and to be
 “fastened to the soles by the same wooden pegs by which
 “the parts of the said soles are bound together.”

“The several parts of the upper leathers are connected
 “among themselves by other wooden pegs.”

[Printed, 4d. No Drawings.]

A.D. 1854, January 21.—No. 148.

GRACE, GEORGE, and JONES, THOMAS FRANCIS. — “Im-
 “provements in boots and shoes, as also boot and shoe socks
 “or inner soles, whereby the same are rendered waterproof.”
 Sheet india-rubber (vulcanized or otherwise), or thin gutta
 percha, or waterproof fabric or webbing, is secured “by the
 “ordinary process,” between “the welt and inner or outer
 “sole” of boots and shoes; it is of sufficient length and
 breadth “to extend up high enough between the upper
 “leather and lining to prevent the wet and moisture arising
 “from ordinary use to pass through to the foot.” The
 patentees recommend that the joining of the ends of a strip
 of rubber (if a strip be used) should be “between the stiffen-
 “ing at the back.”

Waterproof socks or inner soles are “moulded and formed
 “in such a manner that they may slightly rise around the
 “edge;” they may be removeable from the boot or shoe
 or fixed therein. The socks may be made in various ways:—
 by uniting two veneers of cork with a solution of gutta percha
 or india-rubber; or by cementing a thin piece of cork, or
 a piece of chamois or other leather or of felt or woollen cloth,
 to a corresponding piece of gutta percha or india-rubber.

[Printed, 4d. No Drawings.]

A.D. 1854, March 1.—No. 494.

CORTIN, JEAN TOUSSAINT.—(*Provisional protection only.*)—
 “Soling boots and shoes with leather combined with gutta
 “percha and wood, sewed with metallic wire.” The soles
 are made with “leather in one part, gutta percha in another,
 “and wood in the third;” they are sewn on with wire, “so
 “that,” says the inventor, “my shoes and boots worked in
 “that manner are cheaper and stronger than the other
 “ones.”

[Printed, 4d. No Drawings.]

A.D. 1854, March 8.—No. 550.

BEARDSLEY, GEORGE.—“Improvements in round or circular machinery for the manufacture of textile and looped fabrics.”

Among the articles which may be produced by aid of these improvements are “fleece, plain, textile, or looped fabrics to be used as glove linings, cloak linings, and to cover cork soles, &c., and fleece, plaited, looped, or textile fabrics, having a silk, cotton, or worsted back, or the reverse, or both sides fleece, one cotton or silk and the other worsted, to be used for lining under garments, making up into hats, bonnets, gloves, chest protectors, &c., &c.”

The invention consists (1) in the addition of “a looped presser wheel,” for the purpose of “throwing in a loose loop into the fabric over every other needle or otherwise if required;” and in the addition of “two extra wheels connected with the main wheel for making the fabric, so as to throw a loose or fast loop on either side of the fabric for the purpose of raising and carding it in order to form a fleecy surface of various lengths of fleece;” (2) in making the fabric “by having every other needle a blank or a point so as to produce an additional loop, thereby creating an increase of fleece.”

The presser loop wheel “has a bit or point of iron, brass, or other suitable material, introduced between every other tooth or otherwise for the purpose of pressing off the loops from every needle or otherwise at pleasure.” This wheel and an extra thread carrier are used “for causing loose loops to be left on one side of the fabric for the purpose of being made into a fleecy surface.” If both sides are to be fleeced, two such wheels and thread carriers must be used.

The Specification contains a full description of the machinery.

[Printed, 10*d.* Drawing.]

A.D. 1854, April 1.—No. 749.

BELLFORD, AUGUSTE EDOUARD LORADOUX.—(*A communication.*)—(*Provisional protection only.*)—“A new and useful fabric for boot and shoe soles, machine banding, and other purposes.” Cotton duck, canvas, or other woven fabric, is saturated with a mixture of either gutta percha and

shoemakers' wax, or of pitch, resin, and fatty or oleaginous matter; sometimes the gutta percha requires spirits of turpentine to dissolve it perfectly. The gutta percha "penetrates" between the fibres of woven fabric and renders it suitable for the soles of boots and shoes. The saturated fabric may be used in a single piece or in two or more pieces cemented together with the same compound and with or without "a layer" of saturated loose fibrous material between the pieces.

[Printed, 4d. No Drawings.]

A.D. 1854, April 6.—No. 794.

BELLFORD, AUGUSTE EDOUARD LORADOUX.—(*A communication from Messrs. Grover and Baker.*)—"Improvements in" sewing machines." These improvements are applicable chiefly to the invention patented by William Edward Newton on the 19th day of October 1852, No. 14,328. The inventors claim eighteen improvements of which the following belong to the present series.

The first relates to "making the longitudinal seams on" cylindrical or conical bag or hose-like articles, such as "boot legs," &c. :—Instead of a platform the inventors use "a hollow or cylindrical body which contains the motions" described in said patent." The feeding motion differs "only by its position, for it causes the fabric to travel longitudinally with respect to the cylinder." The cylindrical body "may be modified in a variety of ways so as to be most" suitable for the article to be worked upon."

The second consists "in so shaping the machine as to be" able to form transversal seams" upon cylindrical articles :—The platform "is cut out longitudinally on both sides of the" shaft, this latter being encased in a cylindrical or round "shell below the platform." The alteration in the feed apparatus consists in "the quantity of curvature of the ac-" tuating cam."

The ninth consists in the use of lubricating matter (either oily or gummy) for protecting the threads from breakage during sewing :—The thread passes over (or possibly under) "a gorge pulley" which turns in a reservoir containing the lubricating matter.

The seventeenth consists in the use of a clamp "for making" lap or flat" seams :—The clamp is made of "two distinct

“ pieces between which the two pieces of material are secured ” so that the pieces of material “ cannot shift at the seam ; ” the jaws of the clamp are slotted to allow the needle to pass through.

The eighteenth “ consists in a point or points for directing “ or guiding materials, such as leather, by retaining said “ point or points in a furrow which may have been made on “ the material along the line on which it is intended to be “ sewed.” The same result may be obtained by the use of one or more points “ against which the fabric is made to rest “ whilst advancing.”

[Printed, 10d. Drawing.]

A.D. 1854, April 11.—No. 851.

SCOTT, URIAH.—“ Improvements in the adaptation of elastic “ material to boots and shoes, and shoes for horses and other “ animals.” The object of this invention is to cause the pressure of the foot to be “ exerted against an elastic “ substance.”

In boots and shoes an upper and a lower plate with a piece of india-rubber or other elastic material between them are secured to the leather of the heel by a screw or screws ; a “ wearing piece of leather ” is fastened beneath the lower plate. The screws are made with flanges or projecting heads, and in the wearing pieces are recesses large enough to “ allow “ for the play of the screw-head produced by the resiliency of “ the elastic material.”

The invention admits of modifications ; the upper plate may be turned over at the edges to form downward flanges for securing the elastic ; the elastic may be shaped like a bar horse-shoe ; horn, tough wood, stiff leather, or other stiff substance may be used instead of metal plates.

Whatever may be the arrangement, it is covered with “ an “ edging of leather to obtain neatness and other advantages.”

[Printed, 10d. Drawings.]

A.D. 1854, April 18.—No. 890.

BERNARD, JULIAN.—“ Improvements in the manufacture of “ boots and shoes and in the machinery or apparatus connected therewith.”

1. A machine for "paring, rounding, or finishing" the heels and soles of boots and shoes:—A cutter shaft works in a collar-bearing above the bed plate and in a collar-bearing and adjustable footstep below the bed plate. A "grooved cone" driving pulley" is keyed on to the lower end of the shaft. The cutter consists of a series of knives having slightly rounded cutting edges and carried by a metal disc. Below the cutter "and working loose upon the cutter shaft" is a roller or disc against which the shaping template is kept pressed by a spring. The template "is formed in one piece" with or secured to "a socket, which supports the boot or shoe and is fixed to a revolving pin. In the upper part of an "overhanging bracket" is a screw for holding the boot or shoe. On the pin is a worm-wheel actuated by a worm which is fixed on one end of a horizontal shaft (the other end carrying a fly-wheel). The bracket is placed on a compound slide, thereby "providing for the irregularity of the curve of the "boot or shoe." A lever draws back the slide when the operation is completed. The mode of working the machine is explained in the specification.

2. Dies for shaping soles or heels:—Round the lower die is fixed a rim, which projects upwards sufficiently to retain the sole or heel in place during the descent of the upper die. The pressed and shaped sole or heel is thrust out of the lower die by a pin pushed upwards by a lever.

3. An apparatus for lasting uppers on insoles:—A frame carrying spring rods (which project inwards) moves on a hinge; at its opposite end is a catch. The last with an upper and insole thereon being secured bottom upwards, the frame is brought down and fastened. The workman with pliers pulls the edges of the upper over the insole, and "as he does" so, the sheet rods will hold the edges of the upper in the "position in which he pulls them until he further secures "them." The patentee describes another apparatus for the same purpose; lateral pressure is imparted to india-rubber, which is thereby pressed towards the upper.

4. A last, whereon soles can be stitched-on "by means of" two needles working from the outside or on one side of the "boot or shoe:—The last is made with a channel around the sole "opposite where the seam is to be placed," so that the needles can be worked without coming into contact with

the last. The mode of stitching and the required apparatus are described in the provisional specification.

[Printed, 1s. Drawings.]

A.D. 1854, April 18.—No. 891.

BERNARD, JULIAN.—“Improvements in stitching and machinery and apparatus connected therewith.” The stitching is performed with two needles and two threads. The needles have an eye near the point, are secured to separate slides, and work in the following manner:—One of them (No. 1) descends into the material, “carrying its thread in a double state with it;” it then returns slightly, when the other (No. 2) with a portion of its thread descends in like manner, “but in its descent it passes between No. 1 needle and a portion of its thread. No. 1 is now withdrawn, but “its thread in the form of a loop is over or around the point of No. 2 needle, and retains it until No. 1 again descends, and in doing so passes between No. 2 needle, and a portion of its thread, and secures a loop in a similar manner.” The operation is then repeated.

The “tightening the stitch” is effected “by means of a nipper or other mechanical equivalent,” by which arrangement the patentee gets rid of “the injurious friction caused by the constant pulling of the thread by the needle and through its eye;” he describes “one mode of performing this operation.”

Another improvement relates to means for actuating needles (whether straight or curved) and imparting motion to the needle slides:—It consists “of an arm, slide, or rod, moving or travelled in the course or direction of its own circle or circumference, and inserting the needles in the material and travelling them in the same manner by means of an intermediate rod actuated by a circular or semicircular slide.”

Another improvement consists in “placing the glass which covers and presses upon the material directly where the needle acts, in the end of a tube or circular part;” the tube “moves upon the lower part of the arm of the machine and forms its socket, upon which it slides up or down as required.”

[Printed, 1s. 2d. Drawing.]

A.D. 1854, May 12.—No. 1063.

AUBUSSON, CHARLES WILLIAM FEUILLADE.—“An improve-
ment in ferrules.” These ferrules are elastic; the lower
part is turned inwards to form a flange for the support of
a collar of gutta percha or its compounds. A piece of india-
rubber stretched and bound round with thread, “so as to
retain it in its extended form,” is partly passed through the
collar and the lower end of the ferrule; the thread is then
taken off, and the rubber will “resume its original form where
it is not confined by the collar.”

These elastic ferrules, although generally used for walking
sticks, umbrellas, crutches, and like articles, “may be ap-
plied to the heels of boots and shoes;” they are to be
“fixed to a projection of the heel,” and then to be “clothed
with leather.”

[Printed, 8d. Drawing.]

A.D. 1854, May 15.—No. 1085.

NEWTON, WILLIAM EDWARD.—(*A communication.*)—“Im-
proved machinery for cutting or shaping wood or other
materials.” Boot-trees are amongst the articles mentioned
to which this invention is peculiarly adapted.

The table whereon the material is to be cut “may be built
in any well-known substantial manner,” and connected to it
is a pulley or drum driven by any first mover by means of
belts which pass round it and the shafts of the cutting cylin-
ders. These shafts rest and rotate in steps in a cross beam;
they have a collar to support the belt and another “imme-
diately underneath the table” to prevent them from rising
out of their steps. The beam is adjustable for the purpose of
adjusting the shafts. The shafts rise up through the table,
and near the top surface of the table the lower cutter-head is
permanently fixed on each. Higher up on each shaft a brace
projects for supporting the removable upper cutter-head and
“for forming a throat to the cutters.” The brace may be of
any shape “so as to form an opening through the cylinder on
each side of it for the purpose of allowing anything of
greater size than the ordinary chips to pass through and
out of and not choke up the cylinder.” The cutters
(generally two in number) are set in inclined or eccentric

grooves or dovetails formed in the upper and lower cutter-heads, and when adjusted, the whole is held together by a nut screwed on to the top of each shaft. "The heel of one knife forms the throat for the next one;" the velocity is about 3,000 rotations per minute.

The pattern is placed on the table; a piece of material is placed on the pattern and held on by means of a few metallic points on the upper side thereof. The two are fed along by the hand or machinery "in the direction of the running of the cutters." The pattern is drawn up against the lower cutter-head (which serves as a guide), and the material against the cutters.

Both sets of cutters "are not absolutely necessary;" one is "sufficient for almost any purpose." Instead of using the lower cutter-head as a guide "the cutter may be let down or the table raised up," so that the pattern may be "on the top of the piece to be cut and be gauged or guided by the upper cutter-head." The guide, whether a cutter-head or not, should be concentric with the cutters. A modified form of the cutter is described; it is used when cutting out "picture frames or such like articles."

[Printed, 10d. Drawing.]

A.D. 1854, May 31.—No. 1209.

BERNARD, JULIAN.—(*Letters Patent void for want of Final Specification.*)—"Improvements in the manufacture or production of boots, shoes, and other protectors for the feet, and in the materials, machinery, or apparatus employed in such manufacture." The first part of this invention relates to inserting nails or rivets and to attaching wooden heels and soles by means of adhesive substance.

The second to uniting uppers and soles "which is performed in a partial vacuum":—"The parts to be united are placed in a chamber, in which an air-tight piston slides and presses the parts together, "a partial vacuum being previously obtained by any suitable exhausting apparatus."

The third, to heating the material or adhesive surface of the parts to be united.

The fourth, to bringing the heating apparatus to the parts to be heated, namely, by passing a heated hollow plate between the parts immediately before they are pressed together.

The fifth, to the employment of lasts "in connection with elastic buttons."

The sixth, to moulding soles and heels upon uppers or upper and inner soles and to the machinery or apparatus required for such purpose.

[Printed, 4d. No Drawings.]

A.D. 1854, June 16.—No. 1308.

COOKE, WILLIAM.—(*Provisional protection only.*)—"Improvements to boots and shoes." The inventor proposes to attach a portion of a second sole to such parts of the original sole "as are now liable to wear." For this purpose he employs leather, gutta percha, india-rubber, or other suitable material, and attaches it by means of cement, nails, or screws.

[Printed, 4d. No Drawings.]

A.D. 1854, June 26.—No. 1405.

MANTEGUES, HENRI.—(*Provisional protection only.*)—"Improvements in the manufacture of boots, shoes, goloshes, or in shoe-making generally." The soles are made of wood, the vamps of leather or other suitable material. The soles are cut "by means of a circular and reciprocating saws."

The improvement consists "in nailing the vamp internally to the top surface of the sole instead of securing it to the edges of the same." Nails are placed either "in holes made round the turned-in edge of the vamp" or "on the contour of the internal sole under which the edges of the vamp are tucked in." A metallic last is then placed "under the vamp on the head of the nails," and by exerting pressure on the last "the nails are all driven in at once."

[Printed, 4d. No Drawings.]

A.D. 1854, July 15.—No. 1564.

SPIRES, JOSEPH.—"Improvements applicable to boots and shoes." The first improvement consists in a "rotary heel," which is composed of (1) a "circular metal plate" screwed to the fixed portion of the boot or shoe heel; (2) a "concentric metal ring or tip" surrounding the plate and "held in its place by a shoulder or otherwise so that it may be made to rotate" when required; (3) a block of wood or horn, or

thicknesses of leather to fill up the concentric ring or tip. On the periphery of the rotating ring or tip "indentations or recesses" are made for the purpose of more conveniently turning the heel by means of one of the instruments hereafter described.

Modifications :—1. "The inner shoulder of the circular tip" is dispensed with ; the tip is held in place by the central plate and the filling piece "being made conical." The plate is strengthened by "cross ribs" and the filling piece is "divided into quarters to fill up the spaces."

2. For dress boots and shoes a leather tip is used ; it is screwed to a circular plate and both are held in place by the central plate which in this modification is made with a shoulder. Or the shoulder may be on the circular plate.

3. The circular plate is moveable and the concentric ring is fixed ; the filling piece is screwed to the moveable plates.

The second improvement relates to instruments for turning the heels when required :—The instruments are clamps. A circular piece of metal provided with a handle has "the internal part of the circle bevelled or made slightly conical to fit the sides of the heel ;" the inside is "further provided with a stud" to fit one of the above-mentioned indentations.

Some clamps are made without a handle but so as to screw on to "the back of a brush which will serve as a handle."

For leather heels (which have not indentations) a spring clamp is used ; the circular part is passed round the heel which is tightly clasped "by forcibly closing the split handle."

[Printed, 10d. Drawing.]

A.D. 1854, July 21.—No. 1605.

ALEXANDRE, ISAIE, and SOMMERVILLE, ALFRED. — (*Provisional protection only.*)—"Improvements in boots and shoes and in socks or inner soles for boots and shoes." Wires or plates of copper and zinc or combinations of such other metals or materials "as will form with the moisture of the foot galvanic or voltaic combinations" are applied to the interior of the bottoms of boots and shoes and to moveable socks or inner soles. The electricity generated during the wearing of such boots, shoes, and socks "gives vigour to the nervous system of weakly or debilitated persons."

[Printed, 4d. No Drawings.]

A.D. 1854, August 7.—No. 1729.

DUQUESNE, EMMANUEL FRANÇOIS.—(*Provisional protection only.*)—"An improved mode of manufacturing gas for illumination." The residuum contained in the retort after distillation is (says the inventor) "animal black of superior quality," and may be used in the manufacture of blacking and for other purposes."

The gas and the residuum are obtained from "bones and other animal refuse of a like nature." The apparatus required is that which is ordinarily used for the manufacture of gas from coal and resin, "some modifications being, however, made in the purifying apparatus."

[Printed, 4d. No Drawings.]

A.D. 1854, August 17.—No. 1800.

BERNARD, JULIAN.—"Improvements in the manufacture of boots and shoes or other coverings for the feet." This invention consists (1) in a mode of uniting outer soles and heels to uppers "previous to such parts being permanently united;" (2) in a mode of uniting such parts permanently. In each mode the patentee employs an apparatus carried by a frame and composed of (1) "a hydrostatic cylinder with its ram" on which is secured (2) a "shoe-holding box or chamber." The top of the chamber is removable and the bottom is recessed for the reception of a last. (3) a rod suspended by a nut from the top of the frame and passing air-tight into the chamber; at its lower end is "a presser of the shape of the sole or part to be pressed and covered with an elastic or yielding material."

1. The upper having put on to the last, and secured to the inner sole, and prepared for the reception of an outer sole, the whole is secured in the recess of the chamber with the last upside down. A coating of adhesive material is applied to the bottom of the boot or shoe; the outer sole (coated or not) is laid on; "a partial vacuum is produced in the chamber by opening a communication between it and any suitable exhauster;" the let-off cock of the cylinder is closed; the pressure cock (which "communicates with an hydrostatic force pump") is opened; the ram raises the chamber, and the sole is forced against the presser. The parts are left under

pressure until sufficiently dry to be removed for the purpose of being further secured by means of pegs.

2. The operation is similar to the one above-mentioned; it is preferable to use a waterproof solution; the outer sole is to have a coating as well as the inner sole; and as much air as possible should be extracted before pressing together the parts which are to be united, so that no air may be "present to vitiate the joining."

Sometimes steam or heated air is passed into the chamber between the parts to be united so as "to heat the intended contact surfaces." Sometimes it is preferred to unite the parts in a dry state."

The presser rod "may be actuated externally by an eccentric screw or other contrivance." The sole of the last may be elastic and the surface of the presser inelastic.

[Printed, *sd.* Drawings.]

A.D. 1854, September 5.—No. 1940.

STOCKER, SAMUEL.—"Coverings for various parts of the human body with a view to the preservation of health." The patentee describes six coverings, of which the fifth and sixth belong to the present series.

He ventilates india-rubber and other waterproof shoes by perforating the upper part, and inserting into the perforation "worsted or other suitable threads or strips of list" or other fabric, thereby allowing the perspiration to escape.

He renders clogs waterproof by "making the external and upper part of paper made impervious to the wet." The heel piece and subsole he makes of wood, leather, or other suitable material.

[Printed, *sd.* Drawing.]

A.D. 1854, September 8.—No. 1966.

BERNARD, JULIAN.—(*Letters Patent void for want of Final Specification.*)—"Improvements in the manufacture of boots and shoes or other coverings for the feet." This invention relates to an apparatus "for effecting the turning in or over of the edge of that part of the leather which forms the tread, this turned over portion being the part for attachment to the heel of the boot or shoe."

F.

E.

A frame is fitted up with "a series of traversing shaper "slides" which are actuated "by a set of eccentrics or other "similar movements." The slides are placed one within the other "in regular gradations of size;" the external one is of a semi-circular shape and comes first into action upon the leather. A "spring arrangement" brings each slide up out of action.

The last covered with the upper leather and an inner sole is placed in the lower part of the frame beneath the slides. The external shaper is caused to descend "and embrace the leather "with but a slight shaping or moulding pressure;" the edge of the leather is thus as it were cupped, the partially turned-over portion "being so constructed as to have its component "particles squeezed or pressed one over the other." The second shaper then descends and "gives a still more severe "bending-over pressure to the leather." "The next and any "succeeding shapers may then be brought down for the completion of the necessary bend."

The operation may be performed on any suitable support without a last; the invention is applicable "for bending-over "the toe portion of the leather."

[Printed, 4*l*. No Drawings.]

A.D. 1854, September 14.—No. 2002.

BERNARD, JULIAN.—(*Provisional protection only*).—"Improvements in the manufacture of boots and shoes or other "coverings for the feet." The inventor proposes to cut out the heel portions of boots and shoes by the aid of machinery "which is automatic or self-acting in its essential details."

"A short vertical cutter spindle" is arranged on a table to rotate in stationary bearings. The spindle projects beneath the table and then carries a band pulley which is connected with any prime mover. The upper end of the spindle is formed with an adjustable nut collar for the reception of the cutters. "These cutters are conveniently made of a metal centre piece "or boss notched or grooved out upon its periphery to receive "the inner dovetailed edges of a set of spiral cutters." The "cutting contour" of these cutters is "formed to a convex "curve, being somewhat wider in diameter on the lower side "when in cutting position." Beneath the collar of the spindle

is “a loose collar disc, truly turned, with a slight bevel upon its periphery, the wider side being downwards.” This disc rests upon a collar “set upon a screw piece of rapid or coarse pitch on the cutter spindle beneath.” This collar has attached to it a lever handle “working by its loose end over an inclined segmental holding rack piece.”

Close by the spindle is the apparatus for holding the blanks; it “consists of a species of frame set upon an adjustable centre carried by a horizontal traverse slide.” Its vertical spindle has on its lower part a metal pattern of the heel, the edge of which is bevelled off “to correspond to the bevelled edge of the disc on the cutter spindle.” A weight or spring keeps the pattern “pressed fairly up against the disc.” In a direct vertical line above the pattern is a holder for clamping down the blank.

The workman sets the cutter in rapid motion, brings up the blank-holder “so as to adjust the blank into cut,” and then “by means of a worm and wheel or other action gradually turns round the blank-holder and its metal pattern upon its dead centre.”

In some instances it is proposed that the boot, shoe, or clog may be placed in the apparatus for the shaping-up of the heel therein.” By an extension of this method of working entire soles with heels complete may be cut out.”

[Printed, 4d. No Drawings.]

A.D. 1854, September 27.—No. 2075.

BARRACLOUGH, CHARLES.—“Improvements in machinery or apparatus for the manufacture of clog soles and patten soles by power.” The patentee employs a revolving wheel formed with openings capable of receiving and holding blocks of wood whilst they are successively being cut to the form of a clog or patten sole, and in connection with the wheel-cutters carried by spindles which have a rapid rotary motion given to them, and are so placed and actuated as “to have an in and out oscillating motion.”

The wheel is toothed on the edge for the purpose of being driven slowly by means of a worm and shaft in gear with the main driving shaft. In the drawing annexed to the Specification there are ten openings on each side of the wheel “formed

"by projecting arms" which are connected at the ends by "portable cross bars." The bars carry screws or set pins for holding the blank blocks between forks or blocks.

The cutter spindles are carried by arms or frames which are hinged on studs or bearings; their driving pulleys receive motion from the main driving shaft by means of a belt. Tappets or guides made to the pattern of the sole required are "fixed to the wheel so as to act upon the spindles and "frames as the wheel turns" and produce an oscillating motion. Weights balance the frames and spindles. Levers, pulleys, cords, and weights keep the belt which drives the spindles tight, "as by the oscillatory motion thereof the belt "is lengthened and shortened."

When the blank blocks have been shaped on two sides, "another arrangement of tappet" is required for shaping the other two sides. Figures 2 and 3 in the sheet of drawings show each arrangement. Figure 5 shows "a mode of constructing the cutters with loose knives screwed thereon."

When the blocks are shaped, they are taken out, and "the "rabbet or place for the welting or top leather is cut out in "the clog soles" by means of "another small rapid rotating cutter."

[Printed, 10*d*. Drawing.]

A.D. 1854, October 14.—No. 2205.

PAPE, JOHN HENRY.—"Improvements in the manufacture of "boots and shoes." The improvements are (1) substituting metal for sole leather, and (2) producing elasticity between the foot and the sole as well as in the inside of the heel.

A piece of sheet metal is cut into the shape of a sole, but somewhat larger than is required for the boot or shoe to which it is to be fixed, and holes are made in it near the edges. A piece of leather or india-rubber (to prevent noise) is applied on the outside; a sheet of india-rubber is laid on the inside; and the three are fixed to the upper either by sewing with soft iron or copper wire, or by nails which are clenched inside. The edges of the metal are turned up, closed all round, and bind the edges of the rubber.

The outside of the heel is formed of sheet metal "which is "notched at one edge so as to fold down in the form of a heel,

“leaving an opening in the middle.” Holes are made through the plate for fixing it on to the boot or shoe. In the hollow heel thus formed is placed a piece of india-rubber, “which at the edges is shut and thus held,” whilst the middle portion of the heel being open “allows the india-rubber to protrude and thus form an elastic surface for the tread.”

The sheet of rubber on the inside of the metal sole “serves not only to prevent dampness, but also forms a kind of hinge between the sole and the heel.”

[Printed, *ed.* Drawing.]

A.D. 1854, October 17.—No. 2220.

VEAL, ARTHUR.—(*Provisional protection only.*)—“An improvement in the manufacture of boots.” The inventor makes wellington boots and other boots of that class in such manner that they expand while being drawn on to the foot and afterwards contract.

This he effects by introducing lengths of elastic webbing at opposite sides of the leg “extending down to the galoche or counter” and a central piece at the instep.

[Printed, *ed.* No Drawings.]

A.D. 1854, October 19.—No. 2236.

MASON, SAMUEL, and BEEBY, WILLIAM.—“Improvements in the manufacture of coverings for the human leg and foot.” The patentees claim six improvements:—

1. A blocked upper forming “a golosh and vamp without seam,” and “blocking-out tongues or pieces to be used as a part of the upper:”—They cut out of a skin a piece of leather somewhat “of an egg shape;” they make incisions near the middle “to form the tongue or lace-pieces and back-piece” (4 figures in the sheet of drawings show the incisions made); immerse the piece in water; pass through the incisions (while wet) a block shaped like a human foot; and by means of stretching block out “an upper leather or part of an upper leather with tongues, lace-pieces, or back-pieces.”

2. Double-sewing the upper leather to the insole:—They cut the upper larger than usual, “so that the edge which passes between the welt and insole when sewn will lap over

"and be sufficient to secure to the centre of the insole by sewing, pegging, riveting, or cementing."

3. Preparing outer soles for an elastic waist :—They shave down the waist, roughen it, damp and contract it as much as possible; when dry they coat it several times with india-rubber cement, and attach to it a piece of india-rubber cut into the shape of a waist.

4. They insert an elastic gusset into the tongue or instep piece of boots and shoes.

5. "Producing a trowser boot or shoe :"—The trousers are made in the ordinary manner, and the instep part is blocked. They attach vamps of leather to the insteps; strengthen the backs and fronts of the legs "as high as the calf;" insert "a piece of boot-webbing" at the side of the seams "to form a loop for ease in pulling-on;" make the shoe portion in the customary way on a last; and attach the legs to the sole.

6. They block out of one piece of leather or cloth "a seamless leg and instep piece," which can be made "into gaiters or riding leggings."

[Printed, 10d. Drawing.]

A.D. 1854, November 8.—No. 2371.

BARTHOLOMEW, GEORGE.—(*Provisional protection only.*)—"Improvements in boots, shoes, and other coverings for the feet." The heels and soles (which need not be so thick as in ordinary boots and shoes) are made in such manner that "the actual wearing surfaces" may be readily renewed when required.

"A thin wedge-shaped or inclined face-piece of metal" is screwed or otherwise attached "to the face of the thin sole portion," so as "to project clear of the sole or heel and act as the internal wedge-holder of the moveable wearing piece." For the heel, the wearing piece is "a piece of leather or other material cut to correspond to the contour of the heel" and having screwed to its inner face "a thin wedge border-piece of metal shaped to embrace and fit to the permanent wedge-piece."

The wearer has "simply to enter the corresponding wedges into holding contact by sliding the moveable piece laterally

“into its place,” and (if required for further security) to pass a couple of screws through the moveable piece into the permanent one.

“The sole is constructed in a similar manner.”

[Printed, 4d. No Drawings.]

A.D. 1854, November 9.—No. 2384.

ROSS, GEORGE.—(*A communication.*)—“Improvements applicable to the manufacture of articles of caoutchouc, or of compositions of which caoutchouc forms a component part.” The chief object of this invention is “to work up and mould into any desired shape scraps and waste pieces of cured or vulcanized rubber” mixed with other matters, such as scraps of cloth, sulphur, white lead, coal or wood tar, or any adhesive substance.”

The ingredients and proportions “found most convenient” are (when preparing rubber which has been vulcanized) rubber 1 lb., coal tar 1 oz., and sulphur from 1 to 2 oz. If the rubber is in its natural state, rubber 1 lb., sulphur $\frac{3}{4}$ oz., litharge $\frac{1}{2}$ oz., and whiting or plaster of Paris $\frac{1}{2}$ lb. In mixing rubber with other substances the ingredients and proportions generally used are 8 lbs. of the above compound, 20 lbs. of rags, 2 lbs. of sulphur, 1 pint of coal tar, and 2 two pints of hard coal tar or asphaltum. The ingredients are ground and kneaded together, and the mass is put into moulds.

The apparatus first described is “for making boot and shoe heels :”—The moulds are arranged so that a hollow space is left round their bottoms and sides “to facilitate the transmission of heat” to them. Hollow dies, which “communicate with and form a part of a chamber,” are attached to a sliding frame. Steam is admitted into the hollow spaces and into the chamber; the dies are depressed; and the proper shape is given to the heels. “In order to check the curing or induration of the top or inner surface of the heel, so that it may adhere to the boot or shoe,” the steam is permitted to escape from the chamber and out of the dies before the heels are removed from the moulds; “cold water is admitted in its stead, which checks the induration of the top or inner face of the heel, and produces the desired effect.” Cold water may be admitted into the hollow spaces if required.

[Printed, 1s. Drawings.]

A.D. 1854, November 10.—No. 2394.

RIMMEL, EUGENE.—(*A communication from Hippolyte Magen.*)—"Improvements in combining matters to be employed in coating fabrics and leather, and for other uses, in substitution of india-rubber." This substitute is applicable for varnishing upper leathers for boots, and when "applied on a strong linen, cotton, or union cloth" by means of "an upright knife above a roller on which the stuff passes tightly stretched," for boots and shoes. Four preparations are given, one for the first layers for common fabrics, one for the last layers and for superior fabrics, one for varnish for real and artificial leather, and one for a more solid preparation.

1. Dissolve in boiling rain or distilled water, 1 lb. of powdered alum, 3 oz. of sulphate of iron, 1 drachm of cyanuret of lead, and $\frac{1}{4}$ drachm of cyanuret of manganese; the last two may however be dispensed with. Add thereto $2\frac{1}{2}$ lbs. of seal oil and potash soap. Wash the mixture with rain or distilled water, and evaporate it to the consistency of paste. Then add 3 lbs. of linseed oil boiled until it becomes thick, 2 lbs. of linseed oil slightly boiled, and nitric acid $\frac{1}{50}$ th part of the weight of the compound; the thickened oil is to be added whilst it is boiling.

2. Boil "till the composition becomes thick, taking care to stir it so that it does not thicken in lumps," 2 lbs. of linseed oil, 3 drachms of tannate of lead, 3 drachms of chloride of manganese, and 3 drachms of powdered alum. When cold, add nitric acid $\frac{1}{50}$ th part of its weight.

3. Mix one part of No. 2 with three parts of turpentine or benzene, into which "are previously dissolved or mixed the colours intended to be used."

4. Melt together two parts by weight of No. 1, one part of sulphur, and one part of tar, and "evaporate to the degree of solidity required."

The number of layers varies according to the degree of finish desired. Each layer is to be dried in a stove and to be pumiced over before another is put on.

[Printed, 4d. No Drawings.]

A.D. 1854, November 14.—No. 2407.

HOWARTH, JAMES.—(*Provisional protection only.*)—"An improvement in boots, shoes, and other coverings for the

“feet.” The object of this invention is “to arrest the passage of moisture from the exterior to the interior” of boots and shoes.

For this purpose plates of any flexible metal or metallic alloy are introduced between the inner and outer soles. The inventor prefers to use the alloy “known in commerce as “Stirling’s patent Britannia metal” on account of its “flexibility, non-liability to corrosion, and cheapness.”

[Printed, 4d. No Drawings.]

A.D. 1854, December 1.—No. 2528.

BERNARD, JULIAN.—“Improvements in the manufacture of “boots and shoes, or other protectors for the feet, and in the “machinery or apparatus connected therewith.” The first improvement consists in uniting soles and heels made of wood to the other parts by coating the surfaces to be united with any suitable cement or solution and by pressure.

The second consists in uniting the different parts of boots and shoes “in a vacuum or a partial vacuum” by means of adhesive cement or cement “in combination with other means “of fastening”:—A slide moving up and down on an upright fixed to a frame carries at the top a “box or shoe-holder”; it is raised or lowered by a lever which is held at any elevation by a rack. Above the box is a chamber bolted to the frame and capable (by means of india-rubber) of making “a “tight joint” with the box. Up through the chamber passes a rod which moves through it air-tight by an arrangement similar to that of the slide; at the bottom of the rod is a surface of india-rubber. In the top of the chamber is an air-tube which communicates with an exhausting apparatus.

A last, having an upper leather and an inner sole thereon, is secured in the box; an outer sole is laid on to the parts; the parts to be united are coated with cement; the chamber is placed on the box; the air is exhausted; the rod is forced down, and the india-rubber is pressed against the outer sole.

The third consists in a method of heating the cement after the last and sole are placed in the box:—A chamber heated by steam contains a moveable heater (an iron plate of about the size of the surface to be heated); the heater is secured to a rod moving on a centre and carrying a handle. “The apparatus being properly placed in relation to the boot or

"shoe," the workman moves the plate over the parts to be heated.

The fourth consists in fastening an elastic bottom to lasts :— This is done by means of a die.

The fifth consists in "attaching or casting plastic or soluble "soles and heels upon boots and shoes":—The last, covered with an upper leather and an inner sole, is placed in a frame secured to a stand. "A chambered plate" fits closely round the last along the edge of the upper and regulates the shape of the sole and heel ; it is pinned to the frame ; it is made in two parts held together by screws. There is a cock for communicating with an exhausting apparatus and an "aperture "for the purpose of admitting air-tight the plastic or soluble "material of which the sole is to be formed and which may be "forced into the mould by any convenient arrangement."

[Printed, 1s. Drawings.]

A.D. 1854, December 29.—No. 2748.

BELL, JOHN ZEPHANIAH.—(*Provisional protection only.*)—

"Improvements in the manufacture of boots and shoes." A metal last with the upper leather and insole upon it is placed in a frame "consisting of five pieces." The frame is pressed against the sides of the last by four springs, "the whole "being contained in a box." The last is forced through the frame by a screw press, and the lower edge of the frame is bevelled, so that when the last is pushed through, the springs "force the upper leather down upon the insole." A bar, working in guides in the bed plate of the press and pressed upwards by a weighted lever, forces the last evenly through the frame.

The last is then put into another frame and forced through it until the toe touches a certain point. In the end of this frame, "corresponding to the toe of the last," is a sliding piece, which while the last is passing through is kept up by a spring. When the last "has reached the level of the point," the sliding piece is pushed back to admit the outer sole.

To fasten the sole and uppers together, brads "are driven "firmly on to the last by means of a die of the shape of the "bottom of the boot or shoe when finished, and in which die "are holes corresponding to those in the sole and heel." After this "the brads are driven by another die similar to the

“ previous one ; but without holes and having small flat surfaces to correspond with the heads of the brads.”

The tools employed “ are fixed to the press head.” To avoid the necessity of shifting the tools for each operation, “ separate presses for each tool are employed and ranged in a line upon one bed plate.” The presses are screw presses driven by bevel wheels on a shaft above the screw. Two wheels are required to drive each press, one for the upward and one for the downward motion.

[Printed, 6d. Drawing.]

1855.

A.D. 1855, January 11.—No. 75.

TOWNSEND, ELMER. — (*A communication from Alfred Swingle.*)—“ New and useful improvements in machinery for “ sewing cloth, leather, or other material.” The improvements connected with the present series are (1) the combination of a feeder (having reciprocating or forward and backward movements) “ with a lifter separate therefrom and made to operate “ so as to lift the material being sewed above the feeder and “ lower it down upon the same ; (2) the combination of a stationary bearer (arranged over the lifter) and a spring (or its equivalent) with the lifter and feeder, “ whereby, during the “ operation of sewing the material and feeding it along, the “ feeder and lifter are not only enabled to accommodate themselves to variations in the thickness of the material being sewed, but the feeder is pressed against the material while “ the lifter is moved downward, and while the said feeder is “ moved ; ” (3) a thread tension apparatus to be employed in “ sewing with a waxed thread.”

1. The lifter slides vertically between parallel guides, and its upper surface “ is arranged a short distance above the top “ surface ” of the table of the machine. The feeder “ is “ formed with its upper end curved to the arc of a circle “ whose centre is in the axis of the pin ” whereon the feeder turns ; it “ extends through the lifter and has its upper end “ notched or provided with teeth.” The advantage of such

arrangement of the lifter is stated by the patentee to be important "in connecting the vamps and the quarters of a shoe, "when one is made to overlap the other."

2. The stationary bearer is "simply a plate of metal;" it is provided with "a long opening or notch, through which the "awl and needle play;" it is placed "directly over the "feeder."

3. The principal parts of this are a roller having "a grooved "periphery" and a smaller and adjustable roller having "a "convex periphery or one curved transversely to fit into the "grooved periphery;" the waxed thread passes between the rollers, thereby "producing a proper and uniform tension of "the thread and preventing the wax thereon from being "scraped therefrom."

The needle used in this machine is hooked or barbed; it has communicated to it up-and-down, reciprocating semi-rotary, and rotary movements; the holes through which it passes are made by an awl or punch forming part of the mechanism.

[Printed, 1s. 4d. Drawings.]

A.D. 1855, January 18.—No. 138.

PIDDING, WILLIAM.—(*Provisional protection only.*)—"Improvements in coverings for the feet of bipeds and quadrupeds." The soles and heels are made of caoutchouc or compounds thereof, having cells therein of various sizes connected together. The cells contain "air, gas, or liquids."

Sometimes the external surfaces of the soles are corrugated by leaving the cells open on one side, stretching the caoutchouc equally in every direction, attaching a sheet of caoutchouc to the open side, and allowing the open side to contract.

Sometimes portions of the external surface are formed of sheet caoutchouc having hardened steel studs secured in perforations therein.

Ventilating boot and shoe socks are made of horsehair intermixed or interwoven with a web of caoutchouc.

[Printed, 4d. No Drawings.]

A.D. 1855, January 19.—No. 144.

MARTIN, ROBERT, and HYAMS, JACOB.—"Improvements in "goloshes or over-shoes." These articles are made of gutta

percha, and the improvement consists in rendering them "lighter, more convenient, and easy of attachment and detachment" than those now manufactured.

These goloshes extend only sufficiently far over the boot or shoe to connect them thereto and to cover those parts "where the junction of the sole and heel with the upper leather occurs." They are made on blocks shaped to the required form and having a projection "for forming a recess in the goloshes to receive the heel of the boot" and a piece for holding the block steady in a vice or other contrivance. In blocks for making women's goloshes the projection is sometimes omitted.

Sheet gutta percha, made plastic by steeping in hot water (or other means), is laid on the block and worked over the edges thereof by pressing and rubbing with the hands. The parts at the waist and toes are worked thinner to give pliability thereto. Elasticity is given to any particular part by the introduction of a piece of caoutchouc, and greater flexibility is given to the whole by using gutta percha mixed with caoutchouc. The shaped golosh is left on the block until the gutta percha is sufficiently set "to admit of the superfluous material being trimmed off;" it is then taken off; the outer edge is bevelled, and the golosh is finished on the outside, "by imitation stitching or ornamenting." A piece of elastic may be affixed to the sides of the golosh; it passes over the instep and gives additional security in the wear.

[Printed, 10d. Drawing.]

A.D. 1855, January 26.—No. 204.

SEARBY, GEORGE.—"Improvements in the manufacture of boots and shoes, also applicable to other articles made of or partly formed of leather." These boots and shoes are made to fit the shape of the foot and ankle without seams, the sole being attached in any convenient manner.

"The leather previous to being curried or afterwards" is saturated with water or a solution of soda in water and is put upon an ordinary last or one "capable of being removed in two or more pieces." The leather is stretched upon the last, softened and worked to the required shape, drawn partly over the sole of the last and fastened by tacks; when removed it will retain its shape. The leather is rendered more pliable

"by shaving or cutting off the external surface or the cuticle of the skin." A waterproof lining is put "between the lining of the sole and of the upper leather," and the boot or shoe is soled "previous to removing the upper leather" from the last. There is cut "a slit or opening in the leather at the top of the last forming the ankle."

For ladies' or dress boots and shoes the leather is embossed either by means of a mould or "by having a raised surface upon the block or last."

The leather is enamelled or varnished whilst on the last, taking care to keep the last revolving during the time that the enamel is baking or being dried.

[Printed, 4d. No Drawings.]

A.D. 1855, February 16.—No. 349.

ABBOTT, WILLIAM.—(*Provisional protection only.*)—"A boot and shoe cleaning machine." This machine consists of a frame carrying an upper spindle with circular brushes, and a cog wheel (or a wheel for a band), and a lower spindle having thereon a larger cog wheel (or a wheel for a band) and a handle.

Motion is obtained by gearing the wheels together and turning the handle; or a treadle and crank may be used instead of the handle.

[Printed, 8d. Drawings.]

A.D. 1855, March 2.—No. 464.

HODGES, WILLIAM.—"Improvements in boot and shoes." This invention relates especially to such boots and shoes as are fastened by lacing or buttoning. A continuous piece of india-ruber web or other elastic material, extending from one side across the front to the other side, is let into the upper. Upon the elastic are fastened pieces of leather containing eyelet holes. The lace used is an elastic cord, allowing the elastic piece "to expand upon the boot being drawn on to the foot," and assisting the piece "in bringing the eyelet holes together again." Thus the boot will present "the appearance of an elastic laced boot without the trouble of lacing."

The pieces containing the eyelet holes "may be in one piece with an imitation lacing." Buttons or other ornamental arrangement may be substituted for the lacing device.

[Printed, 6d. Drawing.]

A.D. 1855, March 7.—No. 502.

KENNEDY, JOHN.—“Improvements in the manufacture of “ boots and shoes.” The patentee claims four improvements :
1. An apparatus “which enables the operator to work in an “ erect or easy position :”—It is fixed on a bench or table, and is composed of (1) a plate carrying a hollow boss ; (2) an upper plate revolving on the boss and made with a row of sockets “ for different sizes of lasts ;” (3) two standards whose lower ends fit into the sockets, their upper ends being provided with cushions for the support of the last ; (4) a strap for securing the last in position ; (5) a bolt provided with a nut and handle “ for the purpose of securing down the strap ;” the bolt passes up through the boss, whose interior is shaped so as to prevent the head of the bolt from turning. The upper plate is fixed in position by inserting a pin through it into one of several holes made in the lower plate. The sockets not in use are kept free from cuttings and dirt by “small knobs.”

2. “The use of metal pins, nails, or rivets, in conjunction “ with metal lasts,” instead of stitching soles to uppers. If wooden pegs are used, a groove is cut in the last. To make the last, a mould is taken of the foot ; it is divided “at the “ instep.” The last is cast in the mould, “care being taken “ to allow for the expansion of the foot,” in two pieces ; one part is made with a tongue which fits into a recess in the other ; the two pieces are made fast together by a screw ; and two holes (for wooden plugs) are formed in the sole.

3. Cutting out soles and insoles, and paring soles and heels : —Pieces of leather (any convenient number) are held tightly between two plates with polished edges and of the required size and shape. The instrument for cutting is a chisel, and when used for paring it slides in a block, “and can be adjusted “ to any depth of heel by having its tang passing through a “ nut on the handle.”

4. “The use of metal heels with top pieces of leather, gutta “ percha, or other similar material :”—A metal shell is screwed or riveted to the sole, and the top piece is so secured to the shell that its position can easily be changed as a portion becomes worn.

[Printed, 8d. Drawing.]

A.D. 1855, March 8.—No. 525.

BERNARD, JULIAN.—“Improvements in the manufacture of “ boots and shoes, or other coverings for the feet, and in the “ machinery or apparatus to be employed therein.” This invention consists in pressing into form by aid of machinery “ that portion of the uppers or counters of boots and shoes “ applicable to the tread or heels and toes.”

The machinery is composed of a bed plate or framing carrying an upright bracket and a standard, which can be raised or lowered by “two lock-nuts,” and be placed in position or be drawn out by a lever handle. To the bracket is secured a shaft carrying eccentrics or cams which force down three slides “gradually and in succession”; the shaft is actuated by pulleys or a crank handle. The slides are caused to rise again by springs.

The workman, having put the upper on the last, secures the last on the standard by means of pins and holes, brings the standard by means of the lever handle into proper position under the slides, turns the crank handle and brings down the slides one after another on to the last; this “has the effect “ and performs the operation of forming or shaping the parts “ of the upper to the desired form or contour, whether it be “ intended to shape either the heel or toe.”

[Printed, *8d.* Drawing.]

A.D. 1855, March 14.—No. 576.

BERNARD, JULIAN.—(*Letters patent void for want of Final Specification.*) — “Improvements in the manufacture of “ boots and shoes or other coverings for the feet, and in the “ machinery connected therewith.” First improvement:—The heel portions are cut out by the aid of the following machinery. On a table is “a short vertical cutter spindle, “ arranged to rotate in stationary bearings.” The lower end of the spindle projects beneath the table and carries a driving pulley; the upper end is “formed with an adjustable nut “ collar for the reception of the cutters.” The cutters are made “of a metal central piece or boss notched or grooved “ out upon its periphery to receive the inner dove-tailed “ edges of a set of spiral cutters.” The cutting contour of these cutters “is formed to a common curve, being

"somewhat wider in diameter on the lower side when in cutting position;" this contour corresponds to the convexity intended to be given to the heel. Beneath "the upper collar bearing" of the spindle is "a loose collar disc" with a slight bevel on its periphery, the wider side being downwards; this disc rests upon a collar "set upon a screw piece of rapid or coarse pitch," and "this supporting collar has attached to it a short lever handle working its loose end over an inclined segmental holding rack piece." Close by the cutter spindle is the apparatus for holding the blanks. This holder is a frame "set upon an adjustable centre, carried by a horizontal transverse slide;" its vertical spindle carries on its lower part a metal pattern (whose edge is bevelled off to correspond to the edge of the disc on the cutter spindle) and above the pattern a holder for clamping down the blank. The pattern is pressed up against the disc by a weight or spring.

The workman sets the cutter in rapid motion, brings up the holder, adjusts the blank into cut, and then "by means of a worm and wheel or other action gradually turns round the blank holder and its metal pattern upon its dead centre."

By an extension of this improvement entire soles with heels complete may be cut out. The boot or shoe itself "may be placed in the apparatus for the shaping up of the heel."

Second improvement:—Tips for the heels and toes of boots and shoes are fastened on by fixing the last (with the boot or shoe bottom thereon) bottom upwards on a stand, placing the tip in position, and pressing down a metal plate with holes in it corresponding to those in the tip; "in this pressed condition it is united or secured" by nails or other fastenings by hand or otherwise.

[Printed, *Ad.* No Drawings.]

A.D. 1855, April 25.—No. 924.

MASON, MARK. — "Machinery or apparatus for manufacturing metallic 'soletips' and 'heels' for clogs, boots, or other coverings for the feet." 1. Machinery for making tips for heels:—A metal framing carries "a steel face plate,"

on which are secured "two adjustable ledges" for the reception of pieces of heated tip-iron. "The first motion" (when the machine is put into driving gear) is obtained from an eccentric on the main shaft, "which, in connection with "a lever and die working in vertical slides, forces the die "down" upon the tip-iron and imparts to it the desired curve. "A second motion" slightly presses inwards the extreme ends of the heel. This motion is obtained from a disc on the main shaft; two projecting teeth or clicks "in the revolution of the disc simultaneously depress "and elevate two vertical side levers, operating upon two "small dies sliding laterally," and giving inward pressure to the extreme ends of the heels. "A third motion" now retains the heel firmly in position; it consists of a V shaped lever ("worked from a fourth motion") carrying at one end a tongue which "slightly advances and firmly secures "the heel upon the face plate." The fourth motion flattens the extreme ends of the heel; it is worked "from an eccentric at the back of the machine," and secured upon the main shaft. The eccentric, "in connection with a "vertical rod and connecting beam working beneath the "machine, operates upon two jaws placed within the tipping "slide." As the jaws are elevated and depressed the slide advances and recedes, "flattening on the face plate the "extreme ends of the heel." The heel being now completed (except punching the holes), the third motion is released and the heel is allowed to fall.

2. Machinery for making sole tips:—A face plate whereon the sole tip is formed is mounted in a metal framing; it "admits of the elevation and depression of the die which "forms the sole tip as well as a similar motion which is "given to two fullering studs. The machine being fed "with a length of heated iron," the first motion is communicated to the fullering studs from a cam secured upon the main shaft. The cam depresses a lever, whose lower end "working between two jaws gives motion to a slide which "carries the fullering studs." The studs are raised above the surface of the plate, "ready to form the indentations "on the sole tip known as fullers." A second motion is caused "by the depression of a second vertical lever from "a cam upon the main shaft;" on the lower end of the

lever is a die “to form the fullers on the fullering studs.” The studs being withdrawn, a third motion is given “from a slotted arm upon the main shaft through a vertical T piece, to the projecting arms of which connecting rods act upon moveable arms, which carry the shapes or dies of the sole tip.” These rods “cause the closing in of the moveable arms and side dies, which as they envelope the die above the surface of the face plate, complete the sole tip with the slight exceptions of punching and flattening.”

A full description of each machine is given in the Specification.

[Printed, 1s. 4d. Drawings.]

A.D. 1855, April 30.—No. 969.

FRANCIS, HENRY.—“Improvements in manufacturing boots and shoes.” The lasts used are of metal and “made with recesses for screws and studs or pins set out accurately, whereby the soles and heels are guided and kept in their proper places.”

The wedge-shaped pieces of metal, nails, and wooden pegs, used for fastening the soles and heels are covered with oils, gums, &c., to prevent them from rusting in the leather and to increase their adhesion; the wooden pegs are also saturated with such oils and resins as will make them waterproof.

The wedges or nails are placed “base downward” in a piece of metal or die having the form of the sole and perforated “to about one third of the depth of the length of the wedge” with as many mortises or holes as there are wedges or nails to be inserted into the sole. The die has fixed in it steel pins “at the same distances and relative positions” as the last. The sole perforated to slide down the pins is placed in contact with the wedge or nail points, and the points are driven into it by a blow or pressure; it is then transferred to the last (which has been previously covered with the upper leather and insole) and slid down the guide pins; the workman then drives the wedges or nails into the upper and insole and cleans off the sole.

The heels are prepared by being pressed into cups or dies before they are nailed on.

The patentee greatly prefers wedges to nails.

[Printed, 1s. Drawings.]

A.D. 1855, May 9.—No. 1036.

BOWLEY, ROBERT KANZOW.—“Improvements in boots and shoes and other coverings for the human foot.” In order to render boots and shoes more comfortable to the wearer and “to obviate the creaking noise occasioned by the friction of the inner and outer soles or the bottom filling thereof against each other,” the patentee uses an inner sole of felt instead of the ordinary leather one.

The method of manufacture presents nothing new:—The upper leather is drawn over the edge of the felt inner sole; a welt is sewn on that portion of the upper which is turned over the inner sole; the outer sole is fixed on by either sewing or pegging, and the boot or shoe is finished off in the usual way.

The felt sole or the outer sole or both may be waterproofed by steeping them in any suitable solution. The felt may be the felt sheeting of commerce or felt made of hair, wool, or other substance; it may be pressed into form in moulds or dies.

[Printed, 4d. No Drawings.]

A.D. 1855, May 10.—No. 1051.

FORBUSH, EDWIN A.—“An improved machine for sewing leather, cloth, &c.” In this machine the material is held by a pair of clamps mounted on a carriage which moves across the machine on rails. On each side of these rails and at right angles thereto is a pair of rails, and “a compound carriage” travels on each pair. The upper part of each compound carriage is provided with a needle of the ordinary form, and the lower part with an awl. The carriages are so constructed and arranged that when they have advanced sufficiently near the material, the upper parts stop, and the lower parts advance to pierce the material. Whilst this is taking place, “the clamp arrangements employed to hold the needles” release their grip, and the needles are driven through the material “by suitable propellers.” The clamps “take hold of the protruded points,” so that when the carriages retreat, they “will have effected an exchange of needles.” On the next advance of the carriages the clamps “by an axial motion” turn the needles “end for end in order to present their points to the work.” After the needles have been drawn a short

distance through the material, the threads brought through "are seized by nippers or pincers which stand out from the front of the carriages," and are "drawn tight into the work." On each side of the material are "sliding spring nippers" which take up the slack of the thread and prevent its entanglement during the advance of the carriages.

In the drawings annexed to the specification the clamps are represented "as formed on their edges in a suitable shape for sewing the side seam of a boot leg." By arranging the pins of the clamp frame "to slide on curved rails" the sewing may be done on a line "which is partly straight and partly curved, or entirely curved, as circumstances may require."

The Specification contains a very full description of the machine; and the arrangement thereof, "although intended to pass two threads through each stitch hole in opposite directions at the same time, may be used to sew with but one thread without changing the principle of construction."

[Printed, 1s. 10d. Drawings.]

A.D. 1855, June 4.—No. 1268.

GODEFROY, PETER AUGUSTIN. — "Improvements in the treatment of gutta percha." The patentee combines with gutta percha "the shells of the fruit of the cocoa-nut tree (*cocos nucifera*) in a finely ground or comminuted state, and produces thereby a material considerably more durable than ordinary gutta percha," and useful "for the soles of boots and in the manufacture of clogs, goloshes, and other articles of similar character."

The cocoa-nut shell, "free from fibre and not damaged by sea-water," is broken into small pieces, well dried, crushed between rollers, ground, and sifted through sieves having meshes of different degrees of fineness so as to obtain powder of three qualities; the first as fine as wheaten flour used in making bread, the second a little coarser, and the third coarser still.

The second quality is employed for soles, clogs, &c.; it should be added when the gutta percha "is in the last state of finishing in the masticator or otherwise, and be well and thoroughly amalgamated therewith."

[Printed, 4d. No Drawings.]

A.D. 1855, July 13.—No. 1571.

BOUSFIELD, GEORGE TOMLINSON.—(*A communication.*)—"Improvements in the manufacture of boots and shoes." This invention relates to the manufacture of lasts called by the inventor "the anatomical last."

The foot is covered with "a sort of gaiter," which is laced together so as to give it the natural shape of the foot, and "so that no inconvenience arises." Plaster is then run round to obtain a mould. Melted gutta percha is poured into the mould, and thus a last is produced "as hard as wood" and representing the foot "in all its parts with perfect accuracy." Gutta percha is added to the last "to lengthen its point" "sufficient to allow the toes room to stretch at their ease."

The last is cut into two parts for shoes and into three parts for boots; the pieces are kept in place by means of a screw.

[Printed, 4d. No Drawings.]

A.D. 1855, July 17.—No. 1599.

PIDDING, WILLIAM.—"Improvements in coverings for the feet of bipeds and quadrupeds." The patentee makes soles and heels for boots, shoes, and other foot coverings, of caoutchouc or a compound thereof with gutta percha in such manner that "there shall be left therein cells or reservoirs (of any size) for the purpose of containing air, gas, or liquids."

Sometimes it is desirable "to enlarge the area or superficie of the treading or external surface of the soles or heels;" this is done by corrugating them in the following manner:—The cells are left open; the caoutchouc is stretched equally in every direction; the cells are filled with air, gas, or liquid; a sheet of caoutchouc is stuck-on; and the stretched part is then allowed to contract.

Sometimes the treading surface is formed of or covered with "a fabric composed of hardened steel studs and sheet caoutchouc, the studs being secured in perforations made in the caoutchouc."

Sometimes the above-described soles and heels are made "in combination with helical, spiral, or other springs of tempered metal, placing them in juxtaposition throughout or in any part or parts."

In some soles and heels “angular or other-shaped studs made of wood, glass, metal, papier mâché, gutta percha,” or other suitable material, are used; these are placed “either in close contact or nearly so in the interior of the india-rubber cases forming the air-soles” and heels.

[Printed, 4d. No Drawings.]

A.D. 1855, July 30.—No. 1729.

COLES, WILLIAM FLETCHER.—“An improvement in the manufacture of boots and shoes.” This invention consists in “applying a lining of thin sheet cork between the ordinary interior lining and the interior surface of the upper of a boot or shoe.”

Sheets of cork, “about $\frac{1}{100}$ th of an inch in thickness,” are cut into linings suitable in shape for the description of boots or shoes to be made. Pieces of cotton, net, or other thin fabric are cemented to the cork by means of a weak india-rubber cement, which is to be spread on the cork and not on the fabric, “so that when using close fabrics they may not become waterproofed.” Edges of fabric are left all round the cork for the purpose of joining the parts together at the required points; the joining is effected by means of india-rubber cement.

In making-up the boots and shoes the patentee uses “an ordinary fabric lining” in addition to the cork lining.

[Printed, 4d. No Drawings.]

A.D. 1855, August 4.—No. 1771.

WHITEMAN, EDWARD.—(*Provisional protection only.*)—“An improvement in the manufacture of waterproof coats, boots, capes, overalls, and other garments.” These articles are made of “a peculiar preparation of leather which will ensure warmth and impermeability to rain and moisture.”

Sheep and other skins are dressed with the wool or hair on, and the flesh side is afterwards enamelled with any waterproof varnish which will not affect the flexibility of the leather. This material is cut up, keeping the woolly or hairy side inwards. For further security against wet it is proposed in some cases “to run enamel varnish into the seams.”

[Printed, 4d. No Drawings.]

A.D. 1855, August 10.—No. 1818.

LATOUR, PHILIPPE, and LATOUR, MAURICE. — “An improved machine to be used for cutting nails and driving them into the shoe.” The machine for effecting these two operations requires four movements; one for “the movement of the shoe;” one for “the movement of the piece supporting the plate that is to be cut out for making the nails;” one for “the movement of the cutter;” and one for “the movement of the hammer.”

1. A “hooped eccentric” on the driving shaft gives an impulse to a “spring wheel” by means of a connecting rod, a ratchet wheel, and a bevelled tooth wheel. This throws into gear “an internal rack” of the same shape as the shoe. The rack is placed “under a slide moving on the machine table,” and the shoe is laid on this slide.

2. A hooped eccentric gives “an alternate impulse” to a rod or arm on which the plate or “reglet” to be cut into nails is placed. This plate “at every oscillation lays its edge on a small flange projecting on a double tube funnel-shaped placed beneath.”

3. Behind the plate there is a fixed cutter, and before it is another cutter “moved by two cogs.” The cogs act alternately on a roller which the moveable cutter bears at its end, causing it to advance towards the fixed cutter. The moveable cutter “either cuts the nail or recedes to allow the rod or arm to oscillate.” The nail drops “on either one side or the other of the double tube and with its sharp end downwards;” its oscillation is caused “by a small projection which causes its thickest end to stand upwards.” The nail descends into “a simple tube that leads it on the shoe.”

4. An eccentric “allows a rod urged by a strong spring to pass through its grooved part.” The rod bears at its lower end a hammer which drives the nail into the shoe; it is immediately afterwards raised up by the eccentric. “The shoe then advances, yielding to the first movement.”

The patentees give a full description of their machine in their Specification.

[Printed, *sd.* Drawing.]

A.D. 1855, September 3.—No. 1993.

GOLDING, GEORGE HEARNDEN.—“A tool or apparatus to be used in the blocking and lasting of leather, and in other cases where a covering is required to be drawn over a solid substance.” This apparatus consists of (1) a rod screw-threaded and held at bottom in a bearing in which it is free to revolve; (2) a horizontal piece (in which the bearing is held) perforated for the passage of nails or screws; (3) a cross-head threaded internally and carried by the rod; (4) an arm at each end of the cross-head and “made to terminate in a grasping or nipping head;” this head is formed by two plates which are moved to or from each other by a screw and nut.

The operation of blocking is as follows:—The leather is placed on a block which is held in a frame; the front of the leather is passed over a pin at the front of the block. The tool is fixed by screws which pass through the horizontal piece into the heel of the block. “The two lower corners of the leather” are gripped by the nipping heads; “the leather is damped and worked somewhat into the shape of the upper part of the block.” The rod is made to revolve, “whereby the cross-head is made to travel up the rod, taking with it the nipping heads, and thus gradually bringing the leather into the desired form of the block.”

[Printed, *ed.* Drawing.]

A.D. 1855, September 3.—No. 1994.

GOLDING, GEORGE HEARNDEN, and PAINE, THOMAS.—“Improvements in the manufacture of boots, shoes, clogs, and other like coverings for the feet.” The under sole, waist, and seat for the heel are formed from one piece of leather, gutta percha, or other material; the piece if not waterproof is rendered “impervious to damp by paying it over with water proofing composition.” If desired, grooves are made on the inner top surface of the piece, “which communicate with the atmosphere, and through perforations in the inner sole with the foot.”

The seat is “hollow in the centre” and is “formed on the inside with a sunk flange or rim for the reception of the heel.”

The heel is composed of a circular metal disc and a leather or other heel piece. The disc is made with a collar screw-threaded on the outside. "The collar hangs down at right angles or nearly so from the under side of the disc;" the space between the outside of the collar and the outer and under edge of the disc "forms a rim which rests upon and is free to turn round in the flange on the inside of the heel seat."

The heel piece is screwed on to the screw thread of the collar and secured by a pin or screw which passes through it and the collar.

By taking out the pin the heel piece can be removed, and a fresh one be screwed on. Or the heel may be made to turn round in the flange and "present a fresh surface for that worn away."

A metal heel covered with leather or other material may be screwed to the collar.

[Printed, 6d. Drawing.]

A.D. 1855, September 4.—No. 1995.

CLARK, CYRUS, and CLARK, JAMES.—"An improvement in the manufacture of boots and shoes." The improvement consists in combining an overshoe of india-rubber, gutta percha, or other material, with a boot or shoe.

The boot or shoe is made in the ordinary manner, with or without a sole; if with a sole, the sole should be of light material. The overshoe is sewn or cemented on to the boot or shoe, the latter serving as a lining to the former.

Or the boot or shoe may be made in the ordinary manner, and an overshoe may be formed thereon by repeated coatings of india-rubber or gutta percha solution.

[Printed, 4d. No Drawings.]

A.D. 1855, October 2.—No. 2198.

BERNARD, JULIAN.—"Improvements in the manufacture or production of boots and shoes or coverings for the feet, and in the machinery or apparatus and in the materials employed in such manufacture." 1. Machinery for "producing and preparing the fastenings" employed for uniting soles and heels to uppers:—The fastenings consist of "leather or fibrous

“ and flexible material.” When leather is used, a continuous strip is produced by placing a piece on a centre, which is connected to the axle of a mitre wheel “gearing into another wheel “ fast on a screw spindle of the necessary pitch.” At or near the other end of the screw and on a suitable table a knife is fixed. A hold is taken of a portion of the leather, and the leather revolving is pulled against the edge of the knife ; “ this “ gives motion to the mitre wheels and screw spindle, causing “ the latter to traverse along or through a fixed nut ” and move the leather gradually to the knife. The strip (of “square “ section”) is made round by drawing it “through a circular “ cutting instrument or fixed punch ;” it may then be saturated with a solution of india-rubber or gutta percha. The strip is wound upon a reel which is placed upon a stud in any convenient part of.

2. A machine “for cutting off the fastening into suitable “ lengths, pressing and inserting them into the boot or shoe, “ and for making the holes in the boot or shoe in which such “ fastenings are inserted :”—The main shaft placed on a cast-iron framing carries “the requisite cams for imparting the “ motion to certain parts of and instruments in the machine ;” it also carries gearing “for connecting it with suitable mechanical arrangements employed for holding the boot or “ shoe and imparting to it the various differential motions “ required.” Parallel with the main shaft a “partially “ rotating or rocking” short shaft forms “the bearings and “ holder of two instruments,” namely, a piercer and an inserter or hammer ; these are placed eccentrically and alternately brought over the precise point at which the hole is made in the boot or shoe. This is effected by giving to the short shaft “a “ partial circular or reciprocating motion” by means of its connection to a lever which is acted upon by a cam on the main shaft. One end of the strip is passed from the reel over a feed roller and is “inserted into and between a pair of dies “ for compressing it ;” it is held in the dies until cut by a knife “placed close and flat upon such dies.” The knife (worked by a lever which is actuated by a cam on the main shaft) having been withdrawn, the portion cut off “is forced “ into one of a series of vertical holes made near the periphery “ of a horizontal revolving carrier by a vertical rod or driver.” This carrier “is placed upon a stud fixed into a bracket which

"carries the wheel, knife, compressing dies, and feeding arrangements;" it has "an intermittent rotary motion imparted to it by means of a click placed on the end of a lever" which is worked by a cam on the main shaft. The dies having been opened by a spring or springs, "the end of the material is again inserted" by means of a cam which actuates a lever. The end of this lever "acts upon and is connected to a spring presser, which presses upon the material and forces it against a small grooved feed wheel or roller placed upon a centre or axis;" the spring presser is fixed on the end of the axis and consequently moves with it. "A partial circular motion being given to this roller, the material is caused to descend into the dies, when a sliding piece or presser is caused by means of a cam to press the said dies together." The material at this stage of the process "is slightly flattened," but a second slide forces forward a tongue "which forms part of the dies, and which completes the compressing process." At the insertion of each fastening the carrier pauses that the hole may be pierced and the fastening inserted, "which is done through a small tube or nozzle screwed into the bracket and forming the communication to the boot or shoe sole or heel."

3. Machinery "for imparting the several differential motions to the boot or shoe, and presenting and holding it at the required angles and position during the process of making the holes and inserting the fastenings":—This machinery is arranged in the same frame as the foregoing. The holder of the boot or shoe is fixed "in a rocking frame carried upon centres within another rocking frame." The latter frame rocks freely upon bearings in a sliding frame which has a lateral motion imparted to it by a cam "moved by means of a rack and click, actuated by a wiper or other convenient arrangement placed upon a vertical shaft." This shaft also actuates the cams for imparting the necessary angular motions to the boot or shoe." Longitudinal motion is given to the boot or shoe through a lever by means of a cam operated on by a rack; the angular motions by cams having "a circular motion imparted to them" and "fixed upon a shaft working horizontally." The grooves of the cams act upon the ends of levers working on fixed centres, "the other ends of these levers being connected by means of universal or ball

“ and socket joints to the frames and rods hereinbefore mentioned,” thereby communicating “a variable or angular” motion. The difference in the surface of the sole is allowed for “by imparting a differential vertical motion to the framing which carries the pressing and inserting machinery,” by means of a cam and lever.

The machinery is described at length in the Specification and is illustrated by six sheets of drawings.

[Printed, 3s. Drawings.]

A.D. 1855, October 8.—No. 2242.

HUBBARD, JOHN.—“An improved sole for boots and shoes.” This sole is composed of leather and gutta percha united in the following manner :—

The middle or tread portion of an ordinary leather sole is cut out, leaving an outer margin piece all round it. The inner edge of the margin thus left is sloped either inwardly or outwardly, by preference outwardly. A suitably shaped piece of gutta percha rendered pliable by heat is put into the vacant space and united to the leather by pressure and gutta percha solution. The inner surface of the sole is covered with a piece of thin leather or woven fabric cemented to it with gutta percha solution. The whole is subjected in a warm state to the pressure of a mould, and when it is cold, “it will be found “a solid waterproof and exceedingly durable sole ;” it can be attached to the upper by any of the ordinary methods.

[Printed, 4d. No Drawings.]

A.D. 1855, October 17.—No. 2328.

AYCKBOURN, FREDERICK.—(*Provisional protection only.*) —“An improved apparatus for brushing and cleaning of boots, “shoes, and trousers.” A framework supports a spindle which carries one or more sets of concave brushes, and at one end a bevelled pulley which is set in motion by means of an endless band ; any power may be employed, steam, hand, or foot.

For brushing trousers the spindle is provided with an additional concave brush ; a cylindrical tube of wicker, cane, or other material is placed inside the trousers to keep them extended.

[Printed, 8d. Drawings.]

A.D. 1855, October 29.—No. 2412.

ROUDIÈRE, LÉON.—(*Provisional protection only.*)—"An improvement in boots for cavalry," that is to say, in boots called Hessian boots. The object of this invention is to prevent the admission of rain, "which dropping along the inside of the leg comes directly into contact with the rider's feet."

"A counter top or knee piece" to be laid on the rider's knee is sewn inside the leg of the boot "and nearly at two-thirds of its height," and metallic eyelets are let into each side of the leg a little above the seam.

The rain will glide over the knee piece into the leg "widened as usual at its upper part," and will pass out through the eyelets.

[Printed, 4d. No Drawings.]

A.D. 1855, November 14.—No. 2567.

GOODYEAR, CHARLES.—"Improvements in shoes and boots when india-rubber is used." In a former invention Mr. Goodyear claimed the ventilating of soles and heels by means of air-chambers therein; he now claims the ventilating of uppers by means of corrugations and perforations.

The uppers are crimped or corrugated "in any convenient manner," and the ribs are perforated "at their highest points" with numerous small holes; this will permit the free circulation of air from the interior, whilst "any moisture falling on the exterior of the uppers will be conducted away by the channels between the ribs." The corrugations "extend to the bulbs and form air-tubes to assist in the general system of ventilation."

Some uppers are made partly of india-rubber and partly of leather dressed without oil; the leather "should be used with the flesh side out and blacked after the shoe is made."

If the upper is of "leather, cloth, or vulcanized rubber, it should be lasted and be secured on the last by threads drawn from edge to edge; the rougher the edges are the better; sometimes holes are punched in the edges "to improve the joint." A sheet of softened gutta percha is laid on as an insole, and the outer sole having its inner surface roughened is placed thereon, and the union of all is effected by pressure.

[Printed, 6d. Drawing.]

A.D. 1855, November 22.—No. 2634.

HIBLING, HENRY.—(*Provisional protection only.*)—"Improvements in waterproof boots and shoes." The golosh portion is made of thin sheet india-rubber or of cloth coated with india-rubber. This portion is cemented "to the upper part of the boot or shoe." The sole is cemented on with a solution made of dissolved india-rubber, "thus rendering the whole waterproof."

[Printed, 4d. No Drawings.]

A.D. 1855, November 27.—No. 2671.

RICE, CHARLES.—(*A communication from Henry G. Tyer and John Helm.*)—"A new or improved method of manufacturing boots or shoes." This improved method consists in uniting the upper (made wholly or in part of india-rubber), the insole, and the outer sole, by means of cement which passes through perforations in the upper.

The insole of cloth, leather, or other substance, is tacked to a last and coated on the outer surface with rubber or gutta percha cement. The upper, cemented with like cement round the lower interior edge about half an inch in width, is drawn over the last; the cemented edge is caused to adhere closely to the insole, and all creases round the toe and heel are skived off. Perforations are made round and through the upper, and "where an extra strain may be reasonably anticipated as across the ball and around the toe and heel," an additional row of perforations may be made. The outer sole, having its inner surface roughened and coated with the cement, is secured to the upper and insole by hammering and rolling; the cement passes through the upper and unites the whole as durably as if stitched. If desirable the perforations "may extend through the insole to the lining."

[Printed, 8d. Drawings.]

A.D. 1855, November 27.—No. 2673.

RICE, CHARLES.—(*A communication from Henry G. Tyer and John Helm.*)—"A new or improved process of preparing cloth, so as to render it nearly, if not entirely, impervious to water, but not so to air, such cloth being particularly

"useful in the manufacture of boots and shoes, or various other articles of dress or utility." The cloth or other fabric is coated with "a thin layer of india-rubber cement of ordinary consistence for spreading." The proportions used in making the cement are about 12 gallons of camphine to 30 lbs. of rubber. The coating is applied (by preference) by means of a machine "calculated to speedily and effectually accomplish the same."

When the goods are coated, "they must be suddenly subjected to a degree of heat," ranging from 140° to 180° Fahr., either in an oven or heated apartment, or by passing them rapidly round a heated drum.

The sudden application of heat causes the camphine to evaporate with great rapidity, and "by its instantaneous escape or separation from and through the gum" to puncture it and leave it "punctured in minute orifices throughout its entire surface." These orifices are too small to allow globules of water to pass through, but sufficiently large and numerous to allow a free passage of air through them.

[Printed, 4d. No Drawings.]

A.D. 1855, December 7.—No. 2771.

VAN DEN HOUT, HERMAN JOHN, and BROWN, EBENEZER. —(*Provisional protection only*).—"Improvements in utilising leather shavings." These shavings are made into sheets "suitable for shoe soles and other useful purposes," by washing them, then spreading a layer of them on a metal surface, then brushing the layer over with paste, glue, or other suitable adhesive matter, then adding alternately a layer of shavings and one of paste until the desired thickness is obtained. The paste preferred is composed of rye flour and glue, but solutions of caoutchouc, gutta-percha, or other adhesive compounds may be used.

When sheets of shavings are thus prepared, they may be transferred to flannel and compressed in a powerful press (flannel being placed between each sheet), and in about two hours they will be sufficiently dry to be finished by passing them between rollers.

[Printed, 4d. No Drawings.]

1856.

A.D. 1856, January 8.—No. 58.

BOWRA, MATTHIAS EDWARD.—(*Provisional protection only.*) —“Improvements in the nature and manufacture of waterproof “garments and other goods.” Caoutchouc, either vulcanized or otherwise, or caoutchouc with any of the known mixtures at present in use, is employed for the purpose of waterproofing cloths for garments and other goods.

The invention, which is applicable to coats, cloaks, caps, hoods, gloves, leggings, boots, shoes, and goloshes, consists in rendering these and like articles waterproof, and ventilating also by means of perforations in parts “where ventilation is “required.” The perforations are covered (where possible) with strapping, “leaving sufficient space at the sides and ends “to allow free escape of the heat and perspiration.”

[Printed, *4d.* No Drawings.]

A.D. 1856, January 16.—No. 121.

DRINZ, DAVID.—(*A communication.*)—“Improvements in “machinery for cutting wood pegs,” suitable to be used “in “making boots and shoes.” Three machines are required; the first cuts a slice from a log of thickness equal to the length of the pegs to be made, and planes the face of each slice; the second scores one side of the slice with V shaped grooves, “having spaces between them equal to the thickness of the “pegs”; the third cuts the grooved slice into pegs.

1. A sliding carriage is mounted on a frame; it has two jaws drawn together by screws, so as to nip the log. On one end of an axle is a plate which carries cutters for planing the face of the log before the slice is cut off. Another axle has at its end a circular saw. The carriage by means of a screw “is traversed “in front of the plate,” so as to plane the face, and then “to “bring it against the saw,” which cuts off a slice. The carriage is brought back by reversing the motion of the screw, and the end of the log is again brought into contact with the plate by means of another screw “which moves the carriage forward.”

2. An “endless chain of tables” passes over two drums. Each table has “four jaws,” two of which are moveable by

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screws. The slices are held between the jaws, two on each table. On the under sides of the tables are racks in which pinions work. The axle whereon the pinions are mounted has "on its further end" a toothed wheel "driven by a snail or "incline" on the face of a disc; this, when in gear, gives "a "continuous forward motion" to the tables. Guide bars on the front of standards "have at their ends screw nuts." Axles passing the nuts are so arranged, that the guide bars "can be "uniformly raised or lowered to the positions required, and "then be clamped." Grooving tools slide on the bars; they are so arranged that they "receive a to-and-fro motion." When the slices have been grooved in one direction by the first tool, "they are turned a quarter round by hand, and are then "grooved in the other direction by the second tool." As the tables approach the tools, they pass under pulleys "which "prevent them from rising from the side frames."

3. On one end of an axle is keyed a disc carrying a crank pin. From the pin motion is communicated to one end of a knife, whose other end is centred to the frame of the machine. The knife "descends sufficiently low to divide the slice of "wood three quarters through." A fluted roller rests on the surface of the wood, and presses thereon by means of a weight suspended from its sliding bearings; on its axle is a ratchet receiving motion "from a driver, which is moved forward by "coming in contact with the knife each time that it comes to "the top of its stroke"; it is drawn back by a spring. When the wood has been divided in one direction, "it is turned one "quarter round, and similarly divided in the other." The slice is prevented from breaking up before the division is completed by an india-rubber band.

[Printed, 1s. 6d. Drawings.]

A.D. 1856, January 21.—No. 158.

GEDGE, JOHN.—(*A communication from H. M. Gillon, junior.*)—(*Provisional protection only.*)—"Improvements in "the manufacture of boots and shoes." This invention applies principally to "half-boots," and the improvement consists in making the uppers without a seam.

Cloth is cut into pieces, which are whipped together and placed "on a camber of the usual form." The pieces are flattened down and bespread with a light coating of paste or

size "to give consistence." The sides are sewn together, "which will give the whole the form of a half boot." The outer leather or other material is then stitched over all, and nailed to the last, and the whole is sewn together "in the manner cloth clothes are sewn." "The sides remaining unsewn form the eyelet parts," into which eyelets for lacing are put; "it is afterwards treated in the ordinary manner, and forms a boot without a seam."

[Printed, 4d. No Drawings.]

A.D. 1856, January 23.—No. 185.

NORRIS, STEPHEN.—"Improvements in the manufacture of boots and shoes, and other coverings for the human feet." The improvements consist in introducing into boots and shoes "gussets of novel and improved construction in combination with ordinary fastenings," whereby the boots, &c. may be readily secured to and detached from the feet, "and at the same time preserved water-tight at such parts when necessary."

In ladies' boots the gussets are of cloth or leather, "so combined with elastic material" that they shall always lie flat. Two gussets are used for each boot; they are let in at the sides and extend "from the top in an ornamental direction" towards the toe or the sole or the heel.

In ladies' slippers the gusset is introduced at the instep "in combination with straps of elastic material."

In men's blucher boots a gusset is affixed to each boot "by a row of stabbing and sewing extending from the top part of the vamp to the seams which connect the front and back parts of the boot together." Sometimes the gusset is let into the back part of the boot, "and the lacing is at the back instead of at the side or front." The boots are to be lasted "in the same manner as wellington boots;" it is proposed also "to form the side seams thereof, or close the fore and back parts," so as to resemble wellington boots when on the feet.

In wellington boots the fore and back parts are connected by gusset pieces, waterproof or otherwise, so that "they may be used as over-boots;" the size is regulated by means of any convenient fastenings.

[Printed, 1s. 4d. Drawings.]

A.D. 1856, January 28.—No. 231.

DESTIBEAUX, JEAN HECTOR.—“An improved waterproof fabric,” to be used in the manufacture of boots and shoes. The fabric is of cotton or linen, “such as a certain fabric called “moleskin.” The coating, applied on both surfaces, is composed of (by preference) 100 parts of boiled linseed oil, “rendered siccative by litharge,” 3 of calcined umber, and 6 of lampblack; it is liquefied, if necessary, with a small quantity of essence of turpentine.

The coating is laid on by hand, or by means of an apparatus, in which the fabric descends from a drum round a stretching or tentering roller (one or more); thence it advances under a hopper containing the coating and having a spatula hinged or fixed to it; thence through a drying stove or over warm plates or cylinders; thence under a smoothing cylinder “to which a vibrating or to-and-fro motion is imparted by a “crank or otherwise,” or under “a segmental block or a “plate;” and thence on to another drum or other tentering rollers. The vibrating cylinder or block may be engraved so as to produce a grain on the fabric. The operation is repeated as often as may be necessary.

The coated fabric is polished with pumice stone, and glazed with a composition of the before-mentioned ingredients “with the addition of a considerable quantity of essence of turpentine.”

A varnish is next applied composed of (by preference) about 100 parts of boiled linseed oil, 3 of litharge, 3 of calcined umber, 3 of powdered Prussian blue, and 2 of dissolved caoutchouc. The varnish is dried in a stove for from 48 to 60 hours, the heat being gradually raised from 85° to 122° Fahr., and the fabric “is to be exposed to the sun.” Various colours may be obtained by substituting them for lampblack “after laying on the last coating but one;” in this case however a white varnish should be used, consisting of 100 parts of oil, 3 of sulphate of zinc, and 3 of dissolved copal resin.

The patentee does not restrict himself to the foregoing proportions or drying ingredients. He claims the application of the fabric “to the manufacture of boots and shoes,” &c.

[Printed, *sd.* Drawing.]

A.D. 1856, February 15.—No. 398.

NEWTON, WILLIAM EDWARD.—(*A communication.*)—"Improved machinery for making boots and shoes," that is to say, for securing the soles to the uppers by pegs of wood or similar material.

The last carrying the upper and sole is fitted to a holder which is provided with a ball and socket joint at its other end, and with a sliding joint. The socket is attached to one end of a bar, which is "moveable end-wise" in its stand. The bar is pressed forward by a coiled spring and can be secured by a clamp and a screw. The last is supported on a spur roller, which "is notched at proper distances for the pegs, and is "turned, one notch at certain times, by a catch." The catch is connected to a lever vibrated by a cam on a crank shaft. The back of the roller forms a bevelled wheel; it gears into a pinion of about half its size. The last is pressed by the bar against the upper portion of the pinion, "so that by the joint "action" of roller and pinion it "is carried accurately at "proper times," when an awl and punch "alternately approach "to pierce the hole and drive the peg." The awl and punch are fitted into two bars which slide parallel to each other; they are connected to a "double crank" on the crank shaft. As the awl recedes an apparatus cuts a peg and drops it into a receiver which brings the peg exactly to the pierced hole.

The apparatus is a rectangular box, "wide enough to receive "the sheets or cards of pegs." The card "being pointed "forms a complete rack for the purpose of being fed along by "the alternate vibration of a catch" on a lever, which is attached to the side of the box and is moved by being connected to a cam on the crank shaft. The cards are put into the bottom of the box (whose back is adjustable by screws); a spring presses them down, and the catch pushes them forward through a slot at the end of the box next the receiver. A knife vibrating on a pivot near the top of the box "strikes between "the points of the first and second pegs and cuts the peg "exactly through." The peg drops into the receiver and is carried down to the hole.

The receiver "in form resembles a bevel pinion," being indented at proper distances to receive the pegs; it is moved by a pawl which is in connection with a lever vibrated by a

cam as the crank shaft revolves. "The awl and punch both "strike through its indentations."

Movements to present all parts of the sole to the action of the awl :—An "annular guide" notched on the inside is supported loosely in bearings "so as to be slipped round" by a pawl which vibrates on the inside of the guide. From the front side of the guide ring a forked guide projects, into which the toe is thrust "when the shoe is being pegged near the heel." As the shoe advances the catch is brought into gear; this "elevates the end of the last and carries it over while the "pegs are being driven." The ring then stops, "and the "shoe travels out of the fork" while it is being pegged along the side. The click is withdrawn, and the ring turns back by means of a barrel spring having a chain attached to the ring. The forked guide receives the heel, and the shoe is pegged round the toe. To place the pegs in a double row the last is alternately raised and lowered by a "waved cam," whereon rests a spring lever "attached to the standards of the spur "rollers." This cam has ten dents; it is moved by a catch connected to a cam on the crank shaft.

All the catches receive their motion from the same cam, and the knife "from a pin in the sliding bar that carries the "punch."

[Printed, *Sc.* Drawing.]

A. D. 1856, February 28.—No. 516.

BROOMAN, RICHARD ARCHIBALD.—(*A communication from Pierre Gédéon Barry.*)—"Improvements in treating bituminous shale, boghead mineral, and other like schistous bodies, "in order to obtain various commercial products therefrom." The products obtained are (1) essential oil, (2) oil for lighting purposes, (3) oil for lubricating machinery, (4) liquid tar, (5) solid tar, (6) a black useful for a pigment and for printing ink, (7) a black having the same properties as animal black, and useful "in the manufacture of blacking," (8) paraffine, (9) ammoniacal water.

Retorts, a receiver, a condenser provided with refrigerating tubes, and purifiers, "consisting of two wooden cases or jackets "lined throughout with lead and provided each with an "agitator," are employed for decomposing the schistous

bodies and extracting oils from them. The raw oils are distilled in an apparatus "consisting of a cucurbit placed over a furnace."

The method of distilling the oils and of separating the tar and the paraffine, &c. is described in the specification, but no process is given for converting any residuum into either black.

[Printed, 8d. Drawing.]

A.D. 1856, March 27.—No. 732.

NICHOLLS, WILLIAM. — (*Provisional protection only.*)—"An improvement in the manufacture of boots and shoes." This invention "is intended principally to apply to boots for the army;" it consists in dispensing with "welts and stuffings," and "the work being visible enables the purchaser to reject any article not properly made."

The upper leather is sewn directly on to the inner sole, and the outer sole is sewn to the upper leather.

[Printed, 4d. No Drawings.]

A.D. 1856, April 2.—No. 800.

SMITH, HENRY. — (*Provisional protection only.*)—"Apparatus for cleaning and polishing boots and shoes." The inventor fixes a brush or brushes on a shaft, and communicates motion thereto by means of wheelwork. He fits the brush or brushes inside a case, wherein are openings for the insertion of the boot or shoe.

[Printed, 4d. No Drawings.]

A.D. 1856, April 5.—No. 827.

BERNARD, JULIAN. — "Improvements in machinery or apparatus employed for manufacturing or making boots and shoes, or other coverings for the feet." This invention relates to improvements on previous inventions of the patentee, especially to the one for which he obtained letters patent, dated October 2nd, 1855, No. 2198.

1. Mechanism for obtaining "the various angular and traversing movements" required for presenting the sole in a suitable position for receiving the pegs:—The last with the boot or shoe thereon being "secured in a moveable frame" by

"a balanced screw clamp" is placed in a "hemispherical holder" which is free to move in "another holder also moving in a third one." This third one moves lengthwise upon a sliding frame which "has a lateral sliding motion upon the framing of the machine." By this combination "the various angles and other motions are obtained with the exception of "the rising or vertical motion." The rising motion is imparted to the framing containing the foregoing arrangements by a crown or other cam, "the framing being balanced upon levers placed on proper centres in a bed plate upon which the machine is erected by means of weights, a feather being placed upon or in the shaft upon which the gearing wheels slide up and down."

2. "Improvements upon the pegging portion of the machine":—(1) Under "the inserting point" is a plate on a centre with one or more openings, similar to a heel but smaller than that to be secured to the boot. The boot is placed bottom upwards "upon a compound sliding bracket" and pressed upwards towards the plate. The plate and parts carrying the boot move upon a "support through which passes the end of a shaft." The shaft "passes through a moveable centre, while the other end is inserted into a grooved cam or template" similar in design to the heel. A stud passes through the template; it has fixed upon its upper end "a forked cross-head containing a spring;" on its lower end is a ratchet wheel. The crosshead "will travel the end of the shaft round in the template as the ratchet wheel is moved." When sufficient fastenings have been put into the heel (the number being represented by the teeth in the ratchet) the machine can be thrown out of gear.

(2) An improved feeding motion consists of "two rollers through which the leather or cord is made to pass." The rollers are regulated to press upon the leather "by means of a screw and spring;" to one of them are connected a toothed wheel and a slotted lever for "making the peg or fastening shorter or longer." A cam regulates the length of the peg.

3. "Arrangements for obtaining a differential insertion of the piercer":—This is effected "by means of an eccentric slide and lever actuated by a cam." The piercer and hammer are made "moveable in their rods or holders," and adjustable nuts are applied to the rods.

4. Method of obtaining the shape, &c. of soles and heels and of paring them at their curved edges :—A guard or fence of suitable shape is employed ; it is held by a bracket, is adjustable by an eccentric, and is placed opposite the cutter. The boot or shoe is to be adjusted with great nicety “by means of slides, screws, and eccentrics.” Sometimes the sole or heel is pared “by the hand instead of placing it in a “frame.” In order to pare that portion of the heel, “which is placed over the sole and extending from one side of the “waist to the other,” the boot or shoe is secured “upon centres in a working frame or cradle, which is also placed “upon centres upon the framing of the machine.” Opposite the part to be cut a disc knife is mounted on a spindle which revolves by means of a drum thereon. “On the side next the “toe of the knife” is placed a fence for the purpose of regulating the cut. A weight or spring holds the cradle to the cutter.

5. Apparatus for supplying glue or other cement to the pegs previous to or at the time of their insertion :—A cylinder containing the glue has fitted into it a plunger “which works “vertically by means of a feather and slot ;” it is secured by a bracket to the front of the framing which carries the pegging mechanism. A spindle, screwed at its lower end where it enters the plunger, carries at its upper end a ratchet wheel actuated by a pawl which is “worked by one of the cams “of the cam shaft of the pegging mechanism.” At the lower end of the cylinder a pipe fitted with a stop-cock conducts the glue to the nozzle of the pegging mechanism. At each turn of the ratchet a drop of glue is expelled down the nozzle into a hole in the sole or heel. The pawl can be disengaged when required by a thumbscrew.

The patentee describes his improvements at great length and illustrates them by eight sheets of drawings.

[Printed, 4s. 2d. Drawings.]

A.D. 1856, April 9.—No. 855.

GEDGE, JOHN.—(*A communication from M. Skjac.*)—(*Provisional protection only.*)—“Improvements in the treatment or preparation of leather and in the manufacture “of articles composed thereof,” namely, boots and sho

saddles and harness. The inventor proposes to purify old leather and render it pliable and supple by means of a preparation of quick lime and albumen.

In making boots and shoes he stretches a lining over "an improved last;" he places the leather over all, and "by one operation" cuts out "the lining, the upper, and the sole" of a boot or shoe. He then brushes these parts (thereby causing them to adhere firmly together) over with a preparation of "gutta, carbonic sulphur, chloride of sulphur, chloride of lime, albumen, quick lime, rain water, linseed and neatsfoot oil, with purified caoutchouc."

He makes the heel by placing a piece of leather at the bottom of a mould and another piece around it; he pours into the hollow a mixture of "resinous or gummy matters, suet and oil, old leather, Roman cement, gutta percha or pure caoutchouc, and burnt cork;" he then places on the top another piece of leather and presses the whole into the shape of a heel.

[Printed, 4d. No Drawings.]

A.D. 1856, May 12.—No. 1115.

AIMONT, PIERRE ERNEST.—(*Provisional protection only*).—

"Improvements in manufacturing shoes and other coverings for the foot." The inventor forms "the sole, quarter, and upper, in a single piece, or in two pieces, by splitting or dividing the leather;" he also claims the splitting machine employed.

He cuts out a piece of leather to the shape represented in the annexed drawing and cuts a slit therein "extending to about half the thickness of the leather." He then places the leather on a frame in the machine, the knife of which splits the leather and thereby "forms a pocket" for the insertion of a last. The smooth side of the leather is used for the upper, the rough side for the sole. On splitting the edges "the lower part of the rough side is brought down or cut away and may serve for the heel piece, &c." Another part "is brought up and bent into shape to form the quarter and sides, the smooth surface being on the inside." Another part "remains whole to form the seat for the heel." The quarters are sewn to the upper.

If two pieces are used (the shapes are shewn in the drawing), they are sewn together. "To raise the upper" a rounded conical blade, resting on a bearing point, has imparted to it "a movement in a horizontal semicircular direction," and a plate whereon the leather is fixed "is gradually lowered till it comes to the proper distance." The upper may be still further raised "by splitting it, so that it may be wider than the sole, and bending back in the thickness and the sides the part between the point where the splitting of the upper stops and that on which the binding is placed." The two parts are then raised on the last and form a ridge on the sides and length of the upper; the ridge may be removed by pressure or cutting.

"To form the bend" the two proper parts are perforated, "leaving a short space unsplit along two sides," and a strip of leather is introduced. "To line the shoe" the portion between the last-named parts is split and raised, and leather is inserted sufficient "to form the lining for the quarters and the heel." The lining is fixed to the sole by rivets or screws. "To increase the thickness of the sole," the sole is split, and a piece is inserted.

The inventor describes his machine and a peculiar tool which he uses for joining the quarters and upper.

[Printed, 6d. Drawing.]

A.D. 1856, June 13.—No. 1400.

DUMÉRY, CONSTANT JOUFFROY. — "Improvements in machinery to be used for manufacturing shoes and boots." Six machines are described; 1, for fitting the materials on the last; 2, for cambering the sole; 3, for completing the screwing (the soles being fastened by headless screws); 4, for cutting off the screw shanks after the screws are inserted; 5, for pressing the heel; 6, for turning the heel.

1. A standard carries "a large elliptical or oblong frame" having a vertical axle on which it revolves. In this frame is a similar one which revolves at right angles to the axis of the larger one. The smaller frame carries at its centre the last, "and a part of the mechanism serving to keep in tension the soft part of the shoe." "One of the extremities of this frame" carries "two arbors parallel to its

"axis," and round the arbors "is arranged click and spring work serving to put in motion flexible tractors, each bearing toothed pincers which take hold of the edges of the vamp to exert tractive force on the leather in the direction of the periphery of the foot." The longitudinal traction is effected "by cutting the support or bearing wheel which carries the last at that part immediately next the heel." The vamp is placed "obliquely in the direction of the length of the last," and the extremity is fixed to the insole by nails, and by means of a cramp which forces the quarter to pass up an inclined plane, "to stretch the quarter and vamp in the direction of its length." To turn the vamp over on the insole "similar click and spring work to that before mentioned" is employed; it is placed in the lower part of the frame and effects the turning over of one side; for the second side the larger frame "is caused to describe a half revolution." Each pincer is set in motion "by a special treadle." To produce "a true and complete chasing or turning over" two jointed pieces are added to the standard; they carry "a special mechanism moving from right to left on a segment of a circle, and presenting consequently in all directions an auxiliary pincer gripping the leather between its two jaws." When the leather is tightened pressure is put on the last, and the leather takes the required form without fold or wrinkle.

2. The sole "in a dry state" is placed in suitably shaped moulds and is subjected to the pressure of a hydraulic press.

3. A central piece is used; the patentee terms it "a spider on account of its structure;" it is a substitute for a last. It is mounted on a spindle, which allows it a rotary motion "to introduce successively into the boot or shoe each one of its six arms." A plate, "divided equally into six divisions" and acted on by a treadle, fixes the spider "in each of the six positions it must take in making a shoe." Each arm acts "as the lower part of a pincer or vice or a press." The upper part or jaw of this press "should be of a C-form, having its back part sliding in the fixed frame, and the lower limb passing under the machine to be attached to a treadle." On the upper limb of the C "the mechanism is mounted which perforates the holes, supplies, conducts, and inserts the screws, and also rivets them in their place." Each extremity

of the arms is solid, and provided with a block of hard tempered steel. "The upper and opposed extremity of the C arm, which gives the pressure, has a hole perforated for the passage of the drill and of the helix or screw." The drill and the screw are carried "by a small moveable swinging frame supported on pivots on one side forming a vertical axis." This frame is carried by a large sliding frame, whose upper extremity is prolonged so as to bear at the same time the mechanism of the helix supplier and all the parts for transmitting motion." The drill has imparted to it "a rotary motion of 2,500 turns a minute." The screw carrier has, in addition to the motions of the drill, a "horizontal motion, an opening and shutting motion of the pincer, and also the facility of resting notwithstanding the continuation of the working of the other parts." The screw reserve is an interior cylinder, "perforated on its circumference with a multitude of cells disposed helically in such manner that in turning the cylinder a new rank is presented at every turn;" each screw comes at the proper moment in front of the exit opening perforated through the covering in which the cylinder moves.

4. A slide, having "an acting and reacting vertical motion produced by an eccentric on the end of the shaft," carries the lower blade of the cutting nipper. The upper part of the nipper is fixed. When the bottom of the sole is presented, "a small interior stop limits the distance to introduce the screws between the nippers." The machine is put in action "by a direct strap without any gear."

5. The principal parts are (1) a frame; (2) a pressing screw; (3) toothed gear transmitting motion from the motive pulley to the screw; (4) rollers, "reversing the motion in order to make the screw turn to the right or to the left," and acted on by treadles; (5) "a large ring having twenty-four openings or chambers to receive the moulds and turning on a spindle; (6) stoppers "around the upper part of the frame to give the pressure of the screw to the moulds;" (7) a horse-shoe cam to maintain the pressure after the screw rises up; (8) a lever "to stop the opening in the ring in front of the point of pressure;" (9) a crank handle "to throw the driving gear of the ring of the press into communication with the bevel wheels."

6. The heel is placed between two moulds having externally the shape of a heel. The moulds are mounted on spindles, which can "be caused to recede from or approach the one or other of the moulds." A blade is lowered, "preceded and followed by two smooth parts rubbing on" the moulds; the blade cuts off the superfluous leather, "according as the moulds are caused to turn and pass over" the blade. The blade acts in the manner of "a box plane." When the circular part is finished, the blade is raised up, and another "of a gouge form" is lowered; this "moves in a slide groove, while the heel remains fixed." Each blade bearer is "articulated with the ball and socket."

Each machine (with its working) is fully described in the Specification.

[Printed, &c. Drawings.]

A.D. 1856, July 1.—No. 1538.

WILD, ALFRED.—"Improvements in the manufacture of boots and shoes." The principal improvement consists "in employing two rows of sewing for connecting the welt to the upper." The second or inner row is parallel to the ordinary outer row, and about half an inch therefrom. The upper is cut "larger than usual, so as to come flush with the inner edge of the welt," full half an inch deeper all round. The insole should be "of a superior quality of leather, by preference the shoulder of a hide;" the welt should be broad. "The space within the inner edge of the welt" is made good and level with filling, either in one solid piece of leather or several small pieces. The lasting, sewing, securing the heel, and finishing are of the customary kind.

[Printed, &c. Drawings.]

A.D. 1856, July 28.—No. 1785.

ITCHIE, GEORGE.—(*Provisional protection only.*)—"Improvements in the manufacture of boots and shoes from materials not hitherto used for that purpose." The soles and heels are made either wholly or partly of a composition consisting of a hard mineral substance and gutta percha, india-rubber, or other material suitable for cementing the particles of the mineral substance together.

The mineral which the inventor prefers is "that known as "corundum;" it is to be ground to a powder or broken into small pieces and to be mixed with the gutta percha or other cement.

[Printed, 4d. No Drawings.]

A.D. 1856, September 29.—No. 2277.

HICKSON, MATTHEW. — "Improvements in waterproofing "certain woven fabrics." In the list of articles to which the patentee applies his invention, he mentions "cloth boots and "other similar articles requiring to be made waterproof and "rendered durable."

The composition which he uses consists of best refined wax and turpentine, about 2 oz. of wax to 1 gallon of turpentine; the wax is melted and mixed with the turpentine whilst hot.

The mixture is put into any suitable vessel, and if the goods to be waterproofed "are to be fancy," they are passed through the mixture, then "over a fire on to a roller;" but if they are to be plain, through the mixture, then over a fire, and then "over and under cylinders and on to a roller."

[Printed, 4d. No Drawings.]

A.D. 1856, October 3.—No. 2317.

JOHNSON, WILLIAM. — (*A communication.*) — "Improvements in the treatment, preparation, or manufacture of sheet "caoutchouc, and in the combination thereof with cloth and "other fabrics." From this combined fabric are made "elastic "or inelastic goods" suitable for "shoes, gaiters, bootees, "boots, suspenders, belts, garments, and the various articles "to which it is applicable."

Sheets of vulcanized caoutchouc are prepared "by desulphurising their surfaces;" this is effected "by first boiling "the sheets in caustic alkali and afterwards in salt pickle" and then "washing the same." The sheets are then roughened on their surfaces to destroy the glossy face.

The cloth is coated thinly on its surface with a solution of caoutchouc, and the solvent is thoroughly evaporated.

The prepared sheet of caoutchouc is applied to the cloth "either in a state of tension or in a free state;" the two are united by pressure between rollers without the application of

cement to the caoutchouc. The sheet may be applied between two pieces of cloth,

Sometimes a shoe last or pattern of the article to be made is covered with a sheet of the caoutchouc ; another last or pattern, " of the size and form to which it is desirable the article " should be extended when in the greatest required dimensions," is covered with cloth or other fabric ; the caoutchouc is drawn over the cloth pattern ; " the whole is covered with " another piece of cloth, closing the seams or joints of the " cloth by sewing or cementing and pressing every part into " close contact."

The inventor describes the machines which he uses " for " buffing the surface or surfaces" of the prepared sheets of caoutchouc, and " for uniting the fabrics and sheet of caoutchouc."

The boiling processes may be dispensed with, but the sheet will then require "about double the amount of buffing or " grinding to prepare its surface for adhesion to the cloth."

[Printed, 8d. Drawing.]

A.D. 1856, November 3.—No. 2578.

MIDDLETON, SAMUEL. — "Improvements in the manufacture of certain articles of leather without seams." Amongst the seamless articles mentioned are the entire "upper or fore " part and back " of a boot or shoe and " the legs of Wellington " boots."

The patentee gives in his provisional and final Specifications a full description of the machines by any of which these articles may be shaped ; the principle of each is "exerting pressure " upon lasts or forms acting upon pieces of leather and made " to pass therewith through plates or dies of metal," causing thereby a flat piece of leather to assume and retain the external shape of such last or form.

One machine is worked like a screw-press ; three screws are employed and plates having openings therein for the passage of the leather and last. The upper plate has countersunk holes formed in it which come opposite to the points of the outer screws. The leather, "simply tanned but not curried," softened " with water and oatmeal," and rubbed with " treacle," is secured between the plates, and the last (inverted) is placed

under the middle screw and forced with the leather through the openings.

In another machine a "hexagonal-shaped" casting is fixed on an axle. Metal plates with openings therein are pinned or screwed to the axle. Other plates with like openings in them and moved up and down by weighted levers hold fast the leather between the plates. The last with the leather is forced through the openings by the rotation of a cam which presses on a rod. More than one article may be formed at a time by the employment of as many cams as there are openings in the plates. Racks may be used instead of cams.

Legs of wellington boots are made from the skins of the legs of oxen and other large animals, tanned and prepared as above stated; they are shaped by the aid of mandrels which "have gentle rotary motion imparted thereto" and of "instruments suitably formed for the purpose."

[Printed, 2s. 2d. Drawings.]

A.D. 1856, November 11.—No. 2651.

BROOMAN, RICHARD ARCHIBALD.—(*A communication from N. Gaillard.*)—(*Provisional protection only.*)—"Improvements in the manufacture of boots and shoes and other like articles." The uppers are united to the soles by means of gutta percha in the following manner:—Holes are punched in the upper and in the sole (if the sole is of leather); a sole of gutta percha is interposed; heat and pressure are applied, and "pegs, rivets, or pins will be started out from the gutta percha and into the holes punched, forming so many rivets to hold the parts firmly together."

A heel of gutta percha is affixed by a solution of gutta percha; or a heel of leather may be applied "through a gutta percha plate by rivets started therefrom, as for the uniting of the soles to the uppers."

[Printed, 4d. No Drawings.]

A.D. 1856, November 11.—No. 2657.

BERNARD, JULIAN.—"Improvements in the manufacture or production of boots and shoes or other coverings for the feet, and in the machinery or apparatus employed in such manufacture." First improvement; an apparatus for

holding a boot or shoe whilst paring the edges of the heel and sole by hand :—The boot or shoe is held between a block and a pressing plate. The block (which turns on a pivot) is hollowed to admit the top side of the last, and the position is fixed by a notched disc on the pivot and a detent. The plate is curved to fit over the sole and turns on a pivot.

The cutter has two handles and is fitted with guards to prevent it from accidentally cutting the upper leather ; it is " somewhat similar to an ordinary spoke shave."

Second ; an apparatus for polishing soles :—A " reciprocating " slide or vibrating arm, " worked by a cam or crank, is fitted with the polishing tool which is rubbed backwards and forwards over the sole. The holder of the boot or shoe can be raised or lowered ; it can be turned horizontally on a centre and vertically or laterally on other centres placed at the toe and heel part.

The polishing tool is a hard piece of wood, bone, or other suitable substance, fitted into the lower end of the arm ; by means of springs it is held down on the sole, " enabling it " to rub freely over the curved portions thereof."

Third ; a machine for cutting out the uppers or other parts of boots and shoes :—A hollow ram, raised by cams or eccentrics, has placed on it a cutter corresponding in size and shape to the article to be cut and open in the middle ; the leather is laid " upon or under its cutting edge," and is cut out " by being pressed against an overhead cutting " table." The piece cut out drops through the opening in the cutter into the ram. The table by self-acting mechanism is moved out of the way after each cut, so that " the view " of the workman is not obstructed when he has to replace " the leather for a fresh cut."

The ram may be dispensed with ; the cutting table may descend on to the cutter ; and the cut leather may fall through the cutter and an opening in a supporting table.

Fourth :—The wooden surface for cutting-out leather is improved by compressing the wood so as to close up the grain or fibres and placing it in a metal frame " with the grain " or fibres running vertically."

Fifth :—Inner soles are made of woven or felted fabrics combined with adhesive materials ; sometimes " a thin skin " or leather sole " is added by pressure."

Sixth :—Lasts are made with the upper or moveable part “tapered to a thin edge at the end nearest to or at the toe.” To ensure a proper union of the parts, one part is slotted, and the other has a corresponding projection or pins thereon.

Seventh; reducing the wear and tear of lasts in pegging machines “by ensuring the entrance of the piercer” into the same holes “it had previously made” in the lasts :—The sole is adjusted inside a recess in a frame; the last with the upper on it is placed “inside the frame on the top of the sole,” and its position is guided and adjusted therein by guides. A slightly wedge-shaped guide which embraces the heel is driven home between the last and the frame. “As the frame itself is always accurately placed in the pegging machine, it follows that the piercer will always enter the last in the same holes.”

Eighth; “shaping the split lifts” used in making heels :—A strip of leather is pressed into the desired shape between a pair of corrugated dies, the lower die having a raised edge round it “corresponding to the required contour of the lift.” The lift is then removed and “pressed between a pair of dies, which squeeze it.”

Ninth; “splitting the lifts :”—A strip of leather is passed between a fixed knife and a roller, the roller being so shaped “as to enable the strip to be cut diagonally across its thickness into two lifts.”

Tenth; “cramping or preparing for lasting” the heels and toes of boots and shoes :—An upper die is attached to a rod or slide; the bottom die “corresponds to the heel or toe of a boot or shoe which is placed upon a holding stud.”

Another method :—Cramping levers, working on one shaft as a centre, descend on to the edges of the upper by means of cams, and are further pressed thereon “by any convenient pressing apparatus.”

Each apparatus is described at length in the Specification.

[Printed, 1s. 4d. Drawings.]

A.D. 1856, November 12.—No. 2669.

BROOMAN, RICHARD ARCHIBALD.—(*A communication from F. Durand.*)—(*Provisional protection only.*)—“A new or “improved felted fabric.” The “fleece or cardings” from

the carding machine are placed in layers one over another, until a "web or sort of wad of the desired thickness is obtained." The wad is pressed between rollers, and "the layers and filaments" are united by sewing. The whole is then "fulled or felted and finished in the usual manner."

"Seamless fabrics" may be manufactured "by cutting out the parts from the web" after the layers have been united, by stitching the parts together "with threads of carded wool," and by "fulling the fabric," when the threads "will be fulled in with the cloth, and an apparently seamless article produced."

For hats, caps, shoes, and other articles "a canvas back" may be added to the fabric; "a nap or pile" may be stitched thereon; and the whole may be fulled or felted.

[Printed, 4d. No Drawings.]

A.D. 1856, November 17.—No. 2717.

BLANCHON, ESTEVES.—(*A communication*).—"Machinery and apparatus for marking and boring leather and other similar substances, for making and cutting screwed pins, and for uniting leather and other similar materials." This invention "is intended chiefly for the pegging of soles to boots, shoes, and other like articles." Three machines are required, and for convenience the inventor fixes them all on one table.

The first marks at regular intervals the spots where holes are to be bored. It consists principally of a hand lever which works at the same time a ratchet wheel and an awl or marker. The leather passes over the wheel and is carried forward the distance of one ratchet at each stroke of the lever, while the awl "makes a regular mark each time the lever is depressed."

The second bores a hole at every point marked by the first. A horizontal spindle carries at one end an awl or similar boring tool and at the other end a bevelled tooth wheel. A crank handle has affixed on its inner end a corresponding bevelled tooth pinion, "all held in a suitable frame." The handle is turned; the awl revolves and bores a hole in the leather presented to it.

The third cuts a screw thread on a piece of wire, screws it into the substances to be united, and cuts off the screw "flush or nearly so with the surface." A horizontal hollow shaft revolves in bearings fixed on standards. A slotted tube is keyed within the shaft. A length of wire is put into the tube; its outer end is turned up to take into the slot and serve as "a carrier to take-round the wire with the hollow "spindles." Motion is given to the whole by bevel wheels and a winch handle. At the opposite end are fixed "screw "dies at right angles to the length of the tube." As the tube rotates, the wire is forced through the dies, "which cut a "thread, draw and drive it forward, and screw it into the "leather or other substances held at the end of the apparatus "a short distance from the front of the dies." When the screw is driven home, the attendant depresses a pedal; this "brings together a pair of nipping levers, which cut off the "peg flush or as flush as need be."

The foregoing is only an outline description of the machinery employed; the inventor gives a very detailed explanation of each machine in his specification.

[Printed, 1s. 4d. Drawings.]

A.D. 1856, November 20.—No. 2746.

FONROBERT, CHARLES FRANÇOIS JULES.—(*Partly a communication.*)—(*Provisional protection only.*)—"Improve-
"ments in the manufacture of boots and shoes." The soles are coated with a composition of gutta percha and tar, two parts (by weight) of gutta percha, and one part of coal tar, mixed together with heat. The soles should be roughened, and the composition be applied in a plastic or liquid state. The composition may be applied "along the seams to render them "waterproof."

[Printed, 4d. No Drawings.]

A.D. 1856, December 5.—No. 2886.

MOORE, HENRY.—"A boot and shoe stud." This stud is composed of a disc about one-fourth of an inch in diameter "like the head of an ordinary flat button," of hard metal "that will receive solder," and of a shank of soft copper wire or other soft, tough, and flexible metal. The shank is either

soldered or riveted to the disc. The shank is passed through a hole in the leather or cloth from the under side; when passed through, it is perforated on the outer side of the leather or cloth, "by means of a pair of forceps, having "on the one side a perforated shaft and on the other a "long sharp point of steel." Any other suitable instrument may be used. Thus on the outer side of the material there is "a round metallic hole like the shank of an ordinary "button," through which strings can be drawn to unite the sides of boots and shoes.

The invention is applicable to all articles which require lacing.

[Printed, 4d. No Drawings.]

A.D. 1856, December 12.—No. 2951.

GIANDONATI, RAFAELLO LOUIS.—(*A communication.*)—"Improvements in overshoes." These articles are made with "a "strengthening or stiffening piece at the heel or back portion," so that the foot may be readily slipped in "without requiring the "shoe to be pulled on by hand." The strengthening piece is by preference of india-rubber or gutta percha. In order to facilitate the removal of the shoe "without soiling the "fingers," a projection is placed on the back of the heel, so that by "placing the toe" thereon the shoe may be readily drawn off. This projection may be cast in india-rubber or gutta percha during the manufacture of the overshoe, or it may be made of metal, wood, or other material fitted on to the overshoe.

[Printed, 6d. Drawing.]

A.D. 1856, December 20.—No. 3015.

WHITE, THOMAS.—"A new or improved manufacture of "boots, shoes, and other covering for the feet." The last with the upper leather thereon is "forced through an elastic "die to a certain point;" when there the die springs over the bottom of the last, forcing the upper leather over the insole, "which is secured by means of teeth and a spring until it is "dry." The sole is placed in another die which has the "required number of teeth points or awls to make holes for "the pegs;" or it is put on to the last and then under a "striking or pressing instrument holding one or more points,

"teeth, or awls." The pegs are put into the holes and driven in by a hammer or pressure.

The last is made of wood or metal or partly of both; it has a flange round the sole for the reception of the insole; it is "made bevelled from the top, coming nearly to an edge at "top and made gradually thicker to the sole." If of wood, a flanged plate of iron is screwed to the sole. In the bottom of the sole there is "a dovetail groove which is filled with lead, also a spring catch or lock to "open both ways, placed as near "the centre as required." For long boots the last has a mortise hole in the ankle portion for the admission of a shaft.

The elastic die :—Within a four-sided frame are four (or more) curved springs, one on each side; and a bar of iron is bolted to each spring. "Four half-square corners" allow the bars to work against them and keep the springs in place. Within the bars are several pieces of metal which form a square, through which "is made a hole in the shape of a shoe "sole." The hole is bevelled all round, smaller at bottom than at top. Round the inside of the hole are fastened pieces of metal which overlap each other; a piece of galvanized india-rubber may be used instead. The half-squares are pinned to two plates which are bolted to the frame.

As the last passes through the die the springs press the upper leather tight on it; when through, the die "springs over "the bottom or sole of the last, carrying the flange of the "upper leather with it over the insole." The pressure is then taken off, and "an oblong ring to fit the hole in the die, having "teeth points or awls all round it" and in the middle a spring throughout which "is a perpendicular piece of iron with a "spear point at one end," is put into the die. Pressure is again applied, and the awls are forced through or partly through the upper leather and insole; at the same time the spring is forced down on the insole, "and is kept there by the "spear point having pierced through the insole into a spring "catch made in the last for the purpose."

The apparatus for (and the mode of) giving pressure is described in the Specification.

A "sole-piercing die or machine :"—An opening of the shape of a sole is cut through a frame. In the opening "at a "certain distance from the surface" is a ledge in which are

drilled two rows of holes for the awls. An awl is fixed in each hole, and the awls are held in place by a plate of the size of the ledge and pierced with corresponding holes. By means of the foregoing and other plates (which are described) the sole, upper leather, and insole are correspondingly pierced by pressure. The pegs are put into a perforated plate which is placed on the sole; they are partially driven in; the plate is taken off, and the remaining portion of the pegs can be driven home or cut off. In addition to the peg-holes "hollow tubes" are used for holding the pegs, which are held in place by a spring or springs and fall into their holes by liberating the springs. "The whole or any part of the sole-piercing die may be used "by up or down pressure with a spring of any kind to force "the leather off the awls."

"A shoe-pegging machine to work by compound lever pressure by treadle:"—An upper and a lower ram move in slides; the upper strikes upon the head or claw of the lower when the latter has been brought firmly down upon the sole; the upper holds the awl or awls and a chisel or knife to cut the pegs; the other holds the last. A tongue prevents each ram from turning. The upper ram has a cross head whereto are connected by rule joints two arms; these are connected by rule joints to a lever which is worked by a treadle. Above the cross head is a ring in connection with a spring bolted to the frame of the machine. The awl and chisel are fixed at the bottom of the ram. The lower ram has at its top a projecting claw "which "overlaps the sole" and prevents the awl "from dragging up "the leather from the last." In the claw is a hole for the passage through of the awl, "and also a hole for the chisel to "pass into, carrying the peg with it up to a hollow tube, "which tube is either fixed upon a spring or made fast." A punch fits "the inside of the tube and flush up to the chisel, "when down carrying the peg with it into the sole." The tube "passes into the head of the top ram, and the punch into "the claw of the bottom ram." At the bottom of the lower ram a spiral spring forces up the ram when pressure is taken off its treadle. At the top of the lower ram and made fast to the claw is a trough "to hold the lath for the pegs or pegs "ready cut;" it is kept up to the chisel by a spring. If cut pegs are used the chisel is dispensed with. The lower ram works through a table which is fastened to the frame of the

machine; the last is placed on the table in a box which is held down by pressing the treadle of the lower ram.

The patentee describes another pegging machine "to be worked by steam power;" it is "exactly the same in all essential respects as the one herein-before described."

[Printed, 1s. Drawings.]

1857.

A.D. 1857, January 29.—No. 266.

MCDONALD, JAMES RODERICK.—(*A communication from Nathaniel Hayward.*)—(*Provisional protection only.*)—"Improvements in the manufacture of india-rubber overshoes." These articles are so constructed that the boot or shoe may be readily inserted or drawn out "without using the hands at all."

The quarter and heel are made of rubber of greater thickness than the fore part, sufficiently thick "to withstand the thrust of the foot" without "lapping or falling down under the heel of the party putting on the overshoe." At the back of the heel a wedge-shaped or other projection is affixed, "whereon to apply the toe in order to remove the overshoe." Sometimes a spring is applied to the heel "for the purpose of keeping the overshoe on the foot."

[Printed, 4d. No Drawings.]

A.D. 1857, February 4.—No. 319.

HAMSHER, JAMES.—(*Letters Patent void for want of Final Specification.*)—"Improvements in the manufacture of blacking for polishing, softening, and preserving boots and shoes and other leathern articles." The ingredients used are ivory black, treacle, rapeseed oil, a mixture of gums, oil of vitriol, copperas, and vinegar. "Suitable proportions" of these (excepting the oil of vitriol and the rapeseed oil) are mixed together; oil of vitriol is then added, and, "after allowing it to exercise chemical action upon them and thereby expend its caustic properties," the requisite quantity of rapeseed oil is mixed in.

This composition forms either liquid or paste blacking according to the proportion of vinegar employed. The blacking may be made in the form of a powder, which "when mixed" and boiled up with vinegar produces a superior liquid blacking."

[Printed, 4d. No Drawings.]

A.D. 1857, February 6.—No. 339.

GREEN, WILLIAM. — "Improvements in manufacturing or "producing substitutes for leather for boots, shoes, and other "uses, and in machinery or apparatus for effecting the same." In making uppers for boots and shoes the fabric or other material intended to form the base or body is brought into shape by drawing or pressing it over "lasts, blocks, or moulds," or by forcing it into moulds or dies.

The shaped pieces receive one or more coatings of "water-proofing composition or other suitable matter capable of "imparting an imitation of leather thereto;" when dry they are again pressed or embossed "so as to imitate the grain of "leather, or stitching or binding or other figure."

The fabric may be prepared for receiving the leather-like surface by coating it with "scrapings" or solution of caoutchouc and gutta percha or a mixture of gutta percha and pitch or asphaltum. Lampblack, whiting, sulphur or sulphuret of lead, and (sometimes) pitch or asphaltum, are combined with the solutions. A first coating may be applied while the fabric is in the piece, and others after the piece is cut into shapes.

When the uppers are made up (in the ordinary manner), they receive a finishing surface of the desired colour by means of one or more coatings of varnish, boiled oil, japan, or other suitable matter, after which they are dried in a stove room.

The uppers are made ventilating by perforating them and lining them with "embossed or other suitable fabrics."

The patentee describes a machine for coating "continuous "lengths" of fabric and one for coating lengths of artificial leather with "varnish or other slow-drying matter;" they are composed principally of straining bars, rollers, troughs containing compositions or colouring matters, scrapers, circular brushes, a drying table, and the usual appendages for motion and guiding.

[Printed, 2s. Drawings.]

A.D. 1857, February 10.—No. 379.

BERNARD, JULIAN.—“Improvements in the manufacture or “production of boots and shoes or coverings for the feet, and “in the machinery or apparatus employed in such manufacture.” The first part of this invention relates to finishing the edges of the soles by pressure applied vertically or laterally:—The sole is put on a block or die surrounded by a rim strong enough to resist any lateral pressure and deep enough to form a recess for the sole. The patentee prefers “to thicken the “sole along the edges” previous to its insertion. The sole is then placed beneath a counterpart and subjected “to any convenient pressure.” The counterpart is sometimes made “in “two or more parts.”

In finishing the sole by lateral pressure, it is placed between “two holding surfaces which are larger in area than the sole “and project beyond it.” A metal rim, “made in segments “corresponding in shape to the edge of the sole,” is pressed “by any convenient means” towards the edge, and the desired result is obtained.

Sometimes a channel or projection is made “along the edge “of the presser or its counterpart” for the purpose of making a channel in the sole or a rib on it.

The second part relates to the use and application of double-pointed brads for fastening soles:—The last with the upper and insole thereon is secured bottom upwards on a stand. A rim supported on the stand receives the sole (with the brads partially inserted on the inner side), and pressure is applied by “a die or other convenient pressing medium.” Sometimes a “compound sole” is fastened on, the intermediate one being by preference of canvas waterproofed or otherwise.

The third part relates to paring soles after being united to the upper:—A punch “of the necessary shape” is used, and the paring is “effected by pressure.” The original last should be replaced by one “sufficiently narrow to allow the cutting “edge to pass the side of the shoe.”

The fourth part relates to drawing and folding the uppers upon the last and insole. The last with the upper and insole thereon is placed bottom upwards in a box which turns on a fixed centre. The table of the machine has a central opening in it to receive the sole of the last which is raised by an

eccentric. A piece of india-rubber, having in it an aperture corresponding to the shape of the sole, is laid on the table so as to surround the sole of the last, and is confined between the table and a plate. A rim "capable of turning to and fro " circularly " between the table and plate has on its inner portion " a number of inclines." As the rim revolves, the inclines act upon " sliding presser plates," whose inner edges " act upon the outer edges of the india-rubber," compress them and force them over the edges of the last, " the rubber " being held down thereon " by a hinged plate. The heel and the portions are compressed by arms which are fitted into slides and are pressed upon in their advance by the presser plates. The edges of the upper and the insole are coated with glue or cement, and when the edges of the upper have been forced over the insole, the whole is held down until the glue is set by a frame hinged to the plate which confines the rubber.

[Printed, 1s. Drawing.]

A.D. 1857, February 26.—No. 560.

GLEW, JOHN HENRY.—(*Provisional protection only.*)—"An " improved method of fastening ladies and gentlemen's boots " and shoes." The fastening supports the ankle without any undue pressure and dispenses with lacing, &c. ; it consists of " a steel-jointed spring with catches for fastening " inserted into the boot or shoe.

[Printed, 4d. No Drawings.]

A.D. 1857, March 6.—No. 656.

KING, JOHN.—(*A communication.*)—(*Provisional protection only.*)—"Improvements in the manufacture of boots and " shoes." The last is of iron having an inclined piece from the top to the instep capable of being raised and lowered by a screw. The edges of the upper leather are brought over the edges of the insole and " are seized by a series of pincers or grippers " attached to levers " which can be drawn back by ratchets. The toe of the last rests upon a pad and is secured by a strap or straps drawn down by levers. The surfaces of the upper and insole which are to be united are " scratched by means of " a card cylinder or roller covered with teeth," are coated with cement, and are heated after fixing on the last. The whole is

put into a press between two dies, "and two wedges or fingers jointed together are passed along it so as to smooth down the creases" and complete the union of the upper and insole. The sole is cemented and pressed on by a machine "in which several metallic straps or moulds are drawn down upon the sole by means of levers."

The sole and heel are stamped out by cast-iron dies in a press; the heel "is filled with a composition of gutta percha, white resin or galipot or turpentine, scraps or raspings of leather, and drying oil heated and mixed together."

The boot or shoe with its last is placed in another machine, in which it is surrounded by a metal plate or guide corresponding to the proper form of the sole." A plane or cutter is passed round the guide and pares the sole.

The cement is prepared by dissolving from 4 to 6 parts of gutta percha and 1 of caoutchouc in "bisulphuret of carbon."

The heating instrument is "a gas burner having a number of jets arranged so as to correspond with the form of the sole."

[Printed, 4d. No Drawings.]

A.D. 1857, April 6.—No. 965.

GOODYEAR, CHARLES.—(*Provisional protection only.*)—

"An improved manufacture of waterproof fabric applicable as a substitute for leather, prunella, embroidered and other ornamental fabrics and stuffs." The fabric is cloth or canvas coated with india-rubber and its compounds and dusted over "with flock made from wool, silk, eider down, leather dust, &c." When the cement has begun to harden, the fabric is passed "through callendering rollers covered with an elastic surface."

This fabric when used for "boots, shoes, and ordinary wearing apparel" is so finely pierced as to render it pervious to air but not to water; it is afterwards vulcanized, although it may be vulcanized before the piercing. The fabric is dyed to give it colour and "also remove all odour of sulphur."

The fabric embossed and further ornamented is particularly applicable for "slippers;" for these and for shoes "the base of the fabric of the uppers" is a pile fabric by preference, thereby avoiding the necessity of lining the article.

[Printed, 4d. No Drawings.]

A.D. 1857, April 6.—No. 966.

GOODYEAR, CHARLES.—“Improvements in the manufacture of waterproof boots and shoes, applicable also in part to boots and shoes of other kinds, and to other outer coverings for the feet.” The first part of this invention relates to the manufacture of waterproof uppers :—These have the appearance of “a compound cloth and glazed leather,” the glazed portion taking the place of “varnished or other leather tips, heel and side pieces.” Pieces of vulcanized rubber in its plastic state are cemented to uppers of perforated sheet rubber. The uppers are then pressed between dies or plates, one of which has a grooved face” so as to form corrugations on the inner “side of the fabric.” The corrugations will assist ventilation “by reason of the channels becoming air-ducts.” To give “a lustrous surface” to the tip, heel, and side pieces, the portions of the die or plate corresponding thereto are polished. When the uppers are placed between the dies or plates, heat is applied to complete the vulcanizing. The pieces may be cemented “to any description of stuffs,” and the sheet rubber need not be perforated.

The second part relates to the manufacture of heels and soles :—The heels are moulded of hard rubber; they are hollow to receive a filling piece of vulcanized rubber, rubber sponge, or other elastic substance; this piece projects beyond the case so as to form a cushion or buffer. For greater durability the vulcanized rubber is mixed with “sand, fibre, &c.” Or the cavity may be filled with pieces of cork, leather, or pressed leather scraps. The cavity may be lined with a strip of steel.

Soles are made on the same principle as the heels. Cushions, strips of steel, and nails, are inserted into moulded rubber; moreover, a perforated plate of metal coated with india-rubber is secured to the inner face of the sole “to prevent the hard compound of which the sole is mainly composed from cracking.”

To obtain “extreme lightness with great strength,” the sole is moulded “in the form of a closed shell.” This shell may contain “metal or hard rubber partitions extending across and dividing the interior into a number of cells.” Portions of the shell are cut away, and the cells so opened out are filled with elastic substance.

The soles and heels are generally moulded separately; if moulded together, they are connected by a perforated sheet of metal covered on both sides with hard rubber compound, and moulded to the form of the hollow of the foot.

[Printed, 8d. Drawing.]

A.D. 1857, April 8.—No. 984.

BOWLEY, ROBERT KANZOW.—“Improvements in boots and “shoes and other similar coverings for the feet.” This invention applies more especially to boots and shoes “intended for “the army and navy, in which such said articles are much “exposed to the rays of the sun.” The improvement (the intention of which is to keep the feet cool) consists in the employment for the uppers “of brown or other light coloured “leather enamelled in the ordinary way.”

[Printed, 4d. No Drawings.]

A.D. 1857, April 28.—No. 1196.

GRUNDY, DENNIS.—(*Provisional protection only.*)—“Improvements in the manufacture of boots, shoes, and clogs.” The bottoms of these articles are made in two parts; the heel and shank are of “wood, gutta percha, or other substance,” the sole of “leather, gutta percha, or a composition of the same “or any similar material.” The two parts are united at the shank with nails, rivets, or other contrivances. If desired, a spring may be fixed longitudinally to “give way to the spring “of the foot.” To wooden heels and to soles of clogs there is attached a piece of elastic material or a covering of leather or gutta percha, to “prevent unpleasant noise or sound.”

[Printed, 4d. No Drawings.]

A.D. 1857, May 2.—No. 1243.

CAUVILLE, ADOLPHE LOUIS.—“Improvements in the manufacture of shoes and boots.” The bottoms of these articles consist of a wooden sole (made in two parts which are jointed together with leather or other flexible material) and an outer sole of leather or gutta percha.

The piece which joins the two portions of the wooden sole may be long enough to form an insole. The last employed is of iron or faced with iron. The edges of the upper leather lap

over the edges of the wooden sole (made thinner at the edges than at the other parts) and are fixed with wooden pegs. The outer sole is fastened on with brass rivets which are clinched against the last. On each side of the joint in the wooden sole, the connecting piece, the wooden sole, and the outer sole are connected "by sewing through these several pieces." The heel is attached in the usual way.

Sometimes the heel is of wood and in one piece with the hinder part of the sole; a groove is then made round the heel to receive the edge of the upper leather which is fixed therein by nails; another groove is made in the front portion of the heel for the reception of the edge of the outer sole, which is secured therein by nails.

Sometimes "a considerable space" is left between the two portions of the wooden sole; the portions are then connected by an insole, and the connection is strengthened by an upper and an under piece of leather.

[Printed, &c. Drawing.]

A.D. 1857, May 4.—No. 1261.

TURNER, ARCHIBALD. — (*Provisional protection only.*)—"Improvements in the manufacture of elastic fabrics, and for the application of such fabrics to the manufacture of boots and shoes." One elastic fabric is made with a woven fabric for a foundation by "combining therewith strands of india-rubber which are secured by cross or weft threads that are thrown across by a carrier." These threads are secured "by two sets of warp threads that are worked by needles and guides."

Another is made on a woven fabric for a foundation by "causing the guides to shog to the right and left" so as to throw their threads to and fro over the rubber strands and cover them; the threads of the guides are secured "by the threads belonging to the needles."

Another without a woven fabric for a foundation is produced "by causing the needles as well as the guides to shog to the right and left, so that they may be tied into one another at the proper intervals."

Another is produced "by throwing a weft thread across at the back of the fabric and securing or tying it in by means of the threads belonging to the needles." The rubber

strands are covered in front with the threads of the guides, which are shogged to and fro for the purpose.

These fabrics are "peculiarly applicable for the manufacture " of the tops of ladies' boots and shoes." An ornamental edging or frill at both selvages may be added if desired.

[Printed, 4d. No Drawings.]

A.D. 1857, May 18.—No. 1397.

NEWTON, WILLIAM EDWARD.—(*A communication.*)—"Improvements in the manufacture of boots, shoes, and other " coverings for the feet." The inner sole and welt are attached to the upper by sewing or pegging. The filling between the inner and the outer soles is composed of scraps of leather, india-rubber, or any material of which india-rubber is compounded. A vulcanized rubber sole and heel made in one piece is cemented to the inner sole and welt. The upper may be of cloth or leather; thus the boot or shoe "permits the " perspiration to pass off as in the ordinary construction," while "the whole sole is waterproof."

The piece forming the sole and heel is subjected to "steam " heat" and shaped in a mould. Any cement may be used, provided it is "a compound capable of being vulcanized;" when it has been applied in one or more coatings to the inner face of the piece, it is heated to from 220° to 250° Fahr. for an hour or two; the coated piece is then fixed by pressure to the inner sole and welt, which have been previously coated with the same or any other cement.

The sole and heel piece may be affixed to a thin outer sole of leather.

[Printed, 6d. Drawing.]

A.D. 1857, May 27.—No. 1497.

CODÉT-NÉGRIER, JEAN LÉONARD.—"Improvements in the " manufacture of boots, shoes, harness, and other articles." The patentee describes a variety of processes, machines, &c., but claims only the four following novelties:—

1. "The manufacture of all kinds of covering for the feet, " garments, and harness, by uniting and cementing the parts " of which they are composed;"—In boots and shoes the uppers and quarters are cemented together. "The cement " is placed on the edges and joined by pressure." The edges of the upper, inside leather, and insole (which must be scraped

on its outer surface), are coated with cement "laid-on in a "sufficiently liquid state to enable it to penetrate into the "pores of the leather." When the coating is nearly dry, a second "rather thicker and quite dry" is applied. The parts are put together, held to the fire to re-heat the surfaces, and united quickly by pressure. Holes are punched all round the upper "so that the cement penetrating these holes forms a "kind of riveting process," and the whole when the outer sole is cemented on forms one piece. Nails, or leather, or wooden pegs "impregnated with cement" may be used for fixing the outer sole. Heels made of either solid or artificial leather are attached with cement.

2. "The composition of the cement":—Equal proportions of purified gutta percha and india-rubber are cut into small pieces, dissolved separately, and "after four days dissolving" mixed together with the addition of one-twentieth part of gum lac (either in fine powder or dissolved in camphine or alcohol) and 5 per cent. of sulphur. The whole is mixed up "until it "acquires the consistency of thick syrup."

3. "The use of refuse parts of leather agglutinated and "made into artificial leather":—Remnants of leather scraped or reduced to thin strips, hair, hemp, cotton and other vegetable fibres, siccative oil, resin, gutta percha, and a small quantity of quick lime in powder or sulphur, are made into a glutinous paste and well pounded in a heated mortar. The paste is then laid on a marble table, heated, and spread out with a heated cast-iron roller.

4. A machine "serving to unite different pieces of leather "by pressure":—Two are described. In one the last is placed on a frame and held by a spring holder which enters it about $1\frac{1}{2}$ inches. Pressing straps regulated by screws and jointed rods press the sole of the last; "those at the two extremities fastening lengthways are elastic." The frame is raised by a vice; a lever "acting on all the joints causes a strong "pressure;" and at each end of the frame are "two jointed "levers with their hooks and holding dogs" to increase the pressure of "the strap at the two extremities."

In the other the frame is raised by a jack or "two iron "rollers moved by two levers." The straps acting on the last "are fixed in the rollers by the adjusting screws."

[Printed, *sd.* Drawing.]

A.D. 1857, June 20.—No. 1731.

BUNN, LOCKINGTON ST. LAWRENCE.—“Improvements in the “manufacture of Wellington boots.” The improvements relate to the legs or upper parts of these boots. The legs are made of “waterproof woven fabric prepared to imitate leather,” either by means of india-rubber combined with sulphur or matters containing sulphur or by coating and impregnating them with drying oils and pigments.

The patentee prefers that the fabric should be composed of two layers cemented together by means of india-rubber combined with sulphur. The whole is afterwards subjected to heat to produce the change in the rubber. The seams may be sewed or cemented together; the other parts of the boots are made of leather and are united to the legs as heretofore.

[Printed, 4d. No Drawings.]

A.D. 1857, July 7.—No. 1882.

FONTAINEMOREAU, PETER ARMAND, le Comte de.—(*A communication.*) — “Improvements in apparatus for the “manufacture of boots and shoes, which apparatus is also “applicable for uniting other articles together.” This apparatus forms screw rivets from a length of wire, forces the rivet into the sole the required length, and cuts off the protruding portion triangularly “so as to form a rivet in the interior.”

A standard fixed on a frame or table supports a balance lever, whose fulcrum is adjustable by means of a slide block, screw, and handle. The outer arm of the lever is connected to a treadle, so that the inner arm can be “raised or lowered for “pressing the screw into the leather.” The wire for forming the screws is supported in a frame fixed to the inner arm of the lever. This frame “is provided with a contrivance for forming “a screw-thread on the wire as the latter descends by a rotary motion.” This motion also causes the screw to enter the leather the required distance, when the screw is cut off by a chisel or cutter “actuated by a lever and rack or other means.” The last is supported “upon adjustable columns “or supports working on a moveable base plate fitted to the “table;” it is made of metal, so that when the triangular end of the screw comes into contact with it, the two ends of the screw “are pressed down and form with the screw-thread a “rivet.”

The annexed sheet of drawings shows the various parts of which the apparatus is composed, and the specification contains an explanation of the working thereof.

[Printed, 10d. Drawing.]

A.D. 1857, July 9.—No. 1908.

DE CLERVILLE, JOHN JULIUS CLÉRO.—(*A communication from Felix Abate.*)—"Improvements in the manufacture of "oilcloth and imitation leather." Among the purposes to which the patentee applies his invention are imitation woven straw for ladies' bonnets and children's hats, hats, caps, shakos, waterproof gaiters, imitation leather for boots and shoes, and clothing. He describes several processes.

1. He makes a "transparent oily ground" upon a dyed or printed fabric by means of three or four coatings of "clarified "linseed oil," previously made drying "by boiling it with "metallic oxides." He smooths the surface with pumice-stone, and then coats it with a hard varnish containing "a "small quantity of Prussian blue for black articles," and with "copal varnish for all colored articles." If the coatings are to remain on the surface of the fabric without penetrating it, he prepares the fabric by first giving it one or two coatings of mucilage.

To imitate woven straw he passes the oilcloth between rollers, one of which has "engraved negatively on its surface" the intended pattern; or he embosses the oilcloth by means of of a copper plate; or he lays on the oilcloth "a piece of the "stuff which he intends to imitate" and passes the whole between rollers.

2. He burns off "the surface wool or nap of the cloth," calenders the cloth, applies the oily coating and varnish, and again calenders with hot rollers.

3. He makes the oily coating "upon a surface different "from that on which it is required, namely, upon a cloth stretched on a frame and previously covered "with a paste "covering." When the oily coating is dry, it is separated from the cloth by wetting the cloth from underneath; it is then laid on the surface on which it is to remain and is fixed thereto "by keeping the article for a little while in a stove "and by rolling it between moderately hot rollers."

He colours oilcloth "by means of dry powders of any kind;" these he spreads with a sieve upon the last coating before it is quite dry, and finishes off by calendering. Sometimes he uses "ground wool or silk" as colouring powder; sometimes he prints upon his oilcloth "with dyeing or oil colours."

[Printed, 4d. No Drawings.]

A.D. 1857, July 11.—No. 1936.

FONTAINEMOREAU, PETER ARMAND, le Comte de. —(*A communication.*)—(*Provisional protection only.*)—"An improved shoe and boot scraper or cleaner." This instrument consists of "a number of pieces of hard leather cut or punched out somewhat similar to the form of a hand." The lower part of each piece has one or more holes punched in it. The instrument is made by passing several of the pieces on wires "side by side in rows" and putting a washer between each piece. The wires are riveted to a metallic plate at each end.

[Printed, 4d. No Drawings.]

A.D. 1857, July 30.—No. 2075.

McKINLEY, WILLIAM, and WALKER, ROBERT.—(*Letters Patent void for want of Final Specification.*)—"An improvement in the manufacture of moulds for forming the soles of boots and shoes." The improvement consists "in preparing and using an electrotype cast in the making of a mould."

"A complete boot or shoe is produced, having the size and form of sole desired," the sole being of gutta percha. The upper is prepared so as not to be injured by the acid used; the sole, together with a small portion of the upper, "is to be made conductive;" the boot or shoe with a last therein is put into the solution and in connection with a galvanic battery; and a metal coating (by preference of copper) is deposited thereon. The coating "is removed, and divided into two parts, and fixed by soldering in an iron or suitable frame."

[Printed, 4d. No Drawings.]

A.D. 1857, September 4.—No. 2318.

TURNER, ARCHIBALD.—“Improvements in the manufacture of elastic fabrics.” These fabrics “present an ornamental appearance, which will render them peculiarly applicable for the manufacture of the tops of ladies’ boots and shoes.” In a former Specification the invention consisted “in binding or sewing together two non-elastic fabrics with a series of elastic strands between them.”

The first of the present improvements consists in dispensing with one of the fabrics and combining with the other strands of india-rubber. These strands are secured to the fabric by cross or weft threads, which are themselves secured by two sets of warp threads worked by needles and guides.

The second consists “in causing the guides which operate one set of the longitudinal warp threads to shog to the right and left, so as to throw their threads to and fro over the india-rubber strands.”

The third consists in making the fabric without a woven fabric for a foundation, but having longitudinal elastic strands; this is produced “by causing the needles as well as the guides to shog to the right and left.”

The fourth produces an elastic fabric “by using a weft thread in place of a woven foundation;” the weft thread “is thrown across and is arranged to occupy the place” of the woven fabric.

The method of manufacturing the foregoing elastic fabrics, as well as a modification of the fourth, is fully described by the patentee; he does not however “mean or intend to confine” himself to any precise arrangement or construction of parts for carrying out his invention.

[Printed, 1s. 8d. Drawings.]

A.D. 1857, September 5.—No. 2323.

KING, JOHN.—(*A communication.*)—(*Provisional protection only.*)—“Improvements in the manufacture of boots and shoes, and in machinery for that purpose.” The last, carrying an upper and an insole, is placed bottom upwards in a machine, the toe resting on a pad and secured by a strap or straps drawn down by levers. The edges of the upper are seized and stretched by pincers attached to levers which are

drawn back and secured by ratchets. The edges of the upper and insole are caused to adhere by means of cement, and the creases are smoothed down by pressure between dies or jaws. The outer sole is fixed on by cement and pressure in a machine in which several metallic straps are drawn down upon the sole by levers.

The sole and heel are stamped out by cast-iron dies; "the heel is filled with a composition of gutta percha, white resin, or galipot, or turpentine, scraps or raspings of leather, and drying oil, heated and mixed together."

The sole when fixed on is pared by placing the boot or shoe with the last in another machine, in which a metal plate or guide surrounds the sole, and a plane or cutter passes round the plate.

The last is made of iron, with an inclined piece from the top to the instep; the piece can be raised or lowered by a screw.

[Printed, 4d. No Drawings.]

A.D. 1857, September 7.—No. 2336.

SCOTT, URIAH.—"Improvements in boots and shoes, applicable in part to shoes for horses." The improvements consist in using india-rubber in combination with metal and leather or other suitable material for heels and soles.

Heels :—A piece of metal of proper shape is screwed or otherwise secured to the boot or shoe; the piece is tapped to receive screws or studs. A piece of india-rubber is laid on the metal piece, and another metal piece secures the rubber to the inner piece by screws or studs. On the outer side of the outer piece are projecting spikes to hold the leather or other wearing surface; or the outer piece may be thick enough to form the wearing part. The two metal pieces are made with flanges which partly overlap the rubber.

Soles are made on the same principle, simply varying the contour of the plates, rubber, and leather.

The foregoing arrangement is intended to render heels and soles elastic under the pressure of the foot.

[Printed, 6d. Drawing.]

A.D. 1857, September 13.—No. 2425.

WILSON, THOMAS.—"An improved boot and shoe cleaning apparatus," consisting of mechanical arrangements in com-

bination with revolving brushes which are disposed in a suitable framing. The brushes are of different shapes and degrees of hardness; they are placed in sets one above the other, the lowermost for brushing off the dirt, the next for blacking the boots or shoes, and the uppermost for polishing.

The boots and shoes are placed on lasts, "having hooks attached to them, which are afterwards suspended from an inclined rod or feeder;" the lasts slide down the rod, until brought in contact with the cross bars of an endless ladder;" the boots and shoes pass up between the sets of brushes to the top of the apparatus; "they are then disconnected from the ladder and suspended on an inclined rod ready for removal." By adjusting the slide bars on which the brushes revolve, boots and shoes of different sizes can be cleaned. The upward motion of the ladder can be stopped "without retarding the revolution of the brushes" by drawing back a clutch on the driving shaft, so that the boots and shoes may be "subjected to a longer action in either set of brushes" when required.

The blacking brushes are supplied by means of boxes "made with a trough to contain water, which is conveyed by capillary attraction to the brushes and by them to the blacking placed in a dry state above the trough." The upper portion of the boxes is ridged or corrugated, so that the brushes in passing over the corrugations "are relieved of any superfluous blacking."

[Printed, 1s. Drawings.]

A.D. 1857, September 26.—No. 2488.

CRICK, THOMAS, and CRICK, JOHN THRONE.—"Improve-ments in the manufacture of boots, shoes, and slippers." The first improvement relates to a mode of attaching the upper leather to the insole. The lower edge of the upper is perforated with holes and drawn together by lacing or sewing, so that when the last (which is of metal and carries the insole) is inserted, the lower part of the upper laps over the edges of the insole. The outer sole is then laid on and fastened by nails, pegs, &c., which are clinched against the last.

The second improvement consists "in finishing the outer sole before attaching it to the inner sole." The sole goes through the following processes, or some of them:—

(1) *It is passed through a machine, "which consists of an*

“endless band carrying the sole under a tool, “which takes off the grain and then passes it forward under a tool which scours it out.”

(2) If the sole is to have a black bottom, it is passed under an inking roller or “a rotary or oscillating inking tool.”

(3) If the bottom is to be bright, an endless band passes it under a rotary or oscillating burnisher heated or not.

(4) It is put into a die to give it the desired curve.

(5) It is passed through a paring machine, “which cuts the edge into a proper shape for setting;” the knife used rotates or oscillates; the sole may be forced forward to the knife either by hand or by mechanism. The setting is performed by means of a rotary or oscillating tool; the edge of the sole is kept up to the tool, or the sole may be moved and the tool stationary.

(6) It is passed through a machine which makes holes in it for the nails or pegs.

A pattern or device may be impressed on the sole or heel before it is attached to the upper by stamping or passing under an engraved roller.

The edge of the insole is bevelled off by a rotary or oscillating knife as above-mentioned.

The lifts of the heel undergo the same processes for paring, &c. as does the sole.

[Printed, 4d. No Drawings.]

A.D. 1857, October 16.—No. 2651.

BERNARD, JULIAN.—“Improvements in the manufacture or production of boots and shoes, or other coverings for the feet, and in machinery, apparatus, and materials to be employed in such manufacture.” The first part of this invention refers to improvements in pegging machinery, for which the patentee obtained letters patent, dated April 5th, 1856, No. 827. The improvements relate more particularly (1) to the means employed for presenting the boot or shoe in the required position, so that a boot or shoe of any size or shape may be pegged “in one machine by adjusting or charging [changing?] certain portions of the describing mechanism to suit the size or shape required,” and (2) to the mode of producing “right and left boots or shoes alternately from one machine without changing or adjusting its working parts.”

The "describing" mechanism consists of "circular cams," whereon are cut or traced "the designs of the right or left boot or shoe, or any number of boots or shoes."

The description given of the machinery is so detailed, that the portions claimed as "novel and original," will be sufficient for an abridgment. These portions are

1. The cams which impart the requisite motion to the boot or shoe are so formed and arranged, "that one set of cams will produce alternately in the same machine right and left boots and shoes."

2. The levers and slides which transmit the motions of the cams to the frame carrying the boot or shoe have "moveable or adjustable centres or acting parts through which their motions are transmitted."

3. The levers which convey the "transverse and angular motions" to the boot or shoe have "slides carrying rollers or studs, which work in the grooves of the actuating cams, the axial line of such rollers or studs being maintained in the direction of the radius of the cam by means of a fixed guide placed parallel to the axial line of the cam."

4. The levers which impart the angular motions have "slots or openings in their free ends" and work "in conjunction with a slide and universal joint."

5. The vertical slides which impart the rising and the falling motion to the boot or shoe are of "a cylindrical form."

6. The cam and slides which impart the rising and falling motion, and the cams and mechanism immediately connected therewith for giving the angular motion, are placed "upon one traversing table or carriage."

7. "Reciprocating platforms" are used "for imparting the requisite feed motions to the pawls which actuate the describing cams"; they are of "sufficient size to allow for the length and breadth traverse of the boot or shoe."

8. All the requisite motions are communicated to the boot or shoe "by means of circumferentially grooved cams."

The "general construction, arrangement, and combination" of the parts are claimed as new.

The second and third parts relate to the construction of lasts:—Holes are made in the sole, "such holes being made larger than the ends of the pegs and placed so as to correspond exactly therewith." Or a groove is cut round the edge

of the last. By either arrangement the pegs will not become fixed in the last. A metal tongue is hinged to the bottom of the last, lying flush with the bottom when in the boot or shoe. A spring keeps the tongue in close contact with the bottom. A screw spindle works through a nut fixed in the last; when rotated it presses the tongue outwards, "forcing up the last" and enabling it to be easily drawn by hand." A sliding bolt or lever may be used instead of the spindle and nut.

The fourth part consists in strengthening the sole where it is joined to the heel and adjoining parts by inserting a perforated plate beneath the sole, extending along the waist and beneath the heels; the plate is fastened on by nails or pegs.

The fifth part relates to means for "compressing the leather" or other similar fastenings while in a continuous length;—"The lengths are passed between rollers grooved and having their grooves graduated in size for the facility of further "compressing the lengths" by passing them through the grooves.

[Printed, 1s. 4d. Drawings.]

A.D. 1857, October 26.—No. 2713.

DE CLIPPELE, CHARLES.—"Improvements in the manufacture of boots and shoes, harness, and driving straps, which improvements are applicable to uniting various materials together, and also for waterproofing." As regards the present series, this invention relates to a composition for cementing "leather to leather, or cloth to cloth, or leather to cloth," thereby dispensing with sewing and other modes of fastening.

The ingredients of the composition (and their proportions) are sulphuret of carbon about one and three quarters of a pint, and gutta-percha about nine and a half ounces.

The sulphuret is put into a glass flask with the gutta-percha cut into very small pieces; the flask is carefully closed and shaken three or four times a day; it must be exposed to the heat of a fire or to the sun, and the composition may be used after four days.

The surfaces to be united are roughened, covered with the composition, and left to dry; when they have become white, they are heated by a fire without flame; when the white parts "assume a brown tint, and there is no humidity perceptible on the surface," they are brought together and submitted

first to "hammering about half a minute," and then to "strong pressure during seven or eight minutes."

[Printed, 4d. No Drawings.]

A.D. 1857, November 11.—No. 2850.

DAVIS, ALBERT JOHN.—"A protective sandal for bathers, " which may also be adapted as an auxiliary for swimmers." The sandal consists of a sole and heel piece, by preference of gutta-percha, of a shape similar to the sole of a shoe, and rather larger than the sole of the foot. Straps of vulcanized caoutchouc or other elastic waterproof material are attached, " so that one may slip over the foot just between the instep " and the joint of the great toe, and the other or others so disposed that the limb may be readily introduced and removed."

The second part of this invention which refers to the use of the sandal "as an auxiliary for swimmers" does not relate to this series.

[Printed, 6d. Drawing.]

A.D. 1857, November 25.—No. 2944.

MABERLY, FREDERICK HERBERT.—"An improved general " polishing machine or apparatus," by means of which " knives, forks, spoons, boots, shoes, and other articles " may be cleaned or polished.

The patentee describes, first, a machine used for cleaning forks :—The front part "is elevated and made hollow to contain two flat brushes," the lower of which projects slightly " for the purpose of receiving the cleaning powder." In front of the brushes is a bed whereon the handles of the forks rest. The prongs are inserted between the brushes. A handle is turned, imparting motion to the brushes by means of a spindle carrying four arms, which "alternately come into contact with a peg or pin." This "causes the brushes to be " advanced." By means of a spring at the back of the brushes, "they are drawn back, having the effect of imparting " constant friction to the forks, the backs of the brushes " having small rollers behind them."

He then describes two modifications of the foregoing machine for cleaning knives.

In the provisional specification, he states, "for shoes or " boots or spoons I use (always with the same apparatus), but

“ in addition circular brushes, fixing the boards or rollers
“ (furnished with brushes) at convenient distances, to suit the
“ size of the articles.”

In the final specification, he states, “ when my invention is
“ used for the purpose of cleaning boots or shoes on the foot,
“ there must be a board on which to place the foot, extending
“ on one side for fixed uprights to meet at the convenient
“ distance to support and fix an upright rod of the needful
“ height, so that it may be turned by hand and thus move the
“ machinery on the foot board, after the manner necessary to
“ execute its object, but after the mode in which the same is
“ accomplished for the other purposes herein mentioned, save
“ that the plane and rotatory motions are combined together
“ to give the motions required.”

* [Printed, 8d. Drawing.]

A.D. 1857, December 2.—No. 2988.

SUMMERS, JOHN, and WORMALD, DAVID.—“ Improve-
“ ments in machinery for manufacturing clog irons and heels
“ and tips for boots or other coverings for the feet.” An
upper block of cast-iron is hinged to a lower block which is
secured to a bed plate. The lower surface of the upper
block is furnished with a steel plate of the shape of the iron to
be bent. A plate slides along the bed plate by means of a
crank and any suitable gearing. Guide plates are fixed to the
bed plate; their inner shape corresponds to the shape of the
iron to be bent. The sliding plate is provided with two small
slides, to which are fixed links carrying an antifriction roller
at each end; the outer rollers come against the guide plates;
the inner ones, as the sliding plate moves towards the crank,
are pressed against the iron to be bent by the guide plates.
Within the upper block is a spring trigger, “ the object of
“ which is to hold the iron to be bent up to the block.” The
trigger is pressed down by a bowl, which also serves to hold
down the upper block while the iron is being bent, and “ to
“ raise it in order to liberate the rod when bent.” The bed
plate “ is placed in a slanting position to allow the rods of
“ iron when bent to slide off” into a receptacle. “ In bend-
“ ing iron for making heels, the spring trigger in the upper
“ block may be dispensed with.”

“ The mode of operation ” is described.

* [Printed, 10d. Drawing.]

A.D. 1857, December 16.—No. 3086.

SEELEY, JOHN FRANCIS.—(*Provisional protection only.*)—

“An improved machine or apparatus for cutting out materials used in the manufacture of boots, shoes, and other coverings for the feet.” The cutting portion consists principally of a roller carrying cutters and prickers on its circumference and of cutting boards covered with lead. The boards work in slides; they are propelled by toothed wheels working into racks or by other means which will cause them to pass from one end of the machine to the other under the roller. The roller is pressed down by screws or otherwise. The machine is so arranged that, as one cutting board advances, another follows in close contact; and when one has arrived at the end of the machine, it falls down and is brought forward by toothed wheels to the front, where it is again raised to its former level.

The material, which is principally “woven material, such as cloth, lasting, &c. to form the uppers of boots and shoes,” is wound upon “four rollers placed in a frame at the front of the machine,” and the four ends are placed between the cutters and prickers and the travelling cutting board; consequently “four thicknesses” are cut at once with the edges pricked for stitching. The workman withdraws the cut pieces.

The machine may be modified to cut out “kid or other leather uppers or soles and heels.”

[Printed, 4d. No Drawings.]

A.D. 1857, December 18.—No. 3112.

WINSLOW, CHARLES.—“An improvement in the manufacture of elastic gore cloth.” The fabric on which this invention is based is either one made of cloth “stretched and united by an elastic cement” or that for which Letters Patent of the United States of America were granted on the “sixth day of May 1856 to Henry G. Tyer and John Helm.” This latter fabric is composed of two pieces of cloth made with the weft threads “in a diagonal position” and united by means of india-rubber or gutta percha cement.

A strip of such fabric, of a width somewhat greater than it is to be when finished, is turned over at each edge for about a quarter of an inch and cemented upon the main part “in

“order to imitate binding.” Each edge before the turning down “is to be cut on an acute angle to or out of parallelism “with either the filling or the warp threads.” To obtain the maximum elasticity the cut may be made “at an acute “angle with the filling of the cloth and also at an acute “angle with the warp threads,” in order that, when the edge is overlapped and turned down, “the line of bend of it may “be at such an acute angle with either the warp or weft “threads as shall be the complements of half the angle “which they make with each other.” By such arrangement elasticity is secured longitudinally in the binding without counteracting the elasticity of the remainder of the fabric.

[Printed, &c. Drawing.]

1858.

A.D. 1858, January 26.—No. 140.

NEWTON, WILLIAM EDWARD. — (*A communication.*)—“A “new or improved fabric intended principally as a substitute “for leather.” This substitute is applicable for “caps, cap “fronts, and soles of boots and shoes”; it consists of cotton or other fibrous substance, “either woven into cloth or in an “unwoven state,” saturated and coated with a compound of linseed oil and burnt umber.

The compound is prepared by boiling about 3 lbs. of umber in 1 gallon of oil gently for from 12 to 24 hours until the compound “when cool will roll in the hands without sticking”; it requires frequent stirring during the boiling.

The preparation of a fabric for caps and cap fronts is described in the first division of this series.

“A substitute for sole leather or other stout leather” is made by uniting (by means of pressure) sheets of batting saturated and coated with the compound; the curing is effected by exposing it in a drying room for about 24 hours to a heat of from 100° to 130° Fahr.; it may afterwards be enamelled if required.

[Printed, &c. No Drawings.]

A.D. 1858, January 28.—No. 157.

ARMITAGE, THOMAS.—“Improvements in elastic fabrics,” applicable to the manufacture of “portions of boots and shoes” and other articles where elasticity is required.”

This invention consists in combining caoutchouc in the form of thread or a thin sheet with cloth of an open texture “so as” to produce an elastic fabric having an even face without “corrugations or puckers.”

The outer or face cloth is to be of an “open, soft, and loose” texture;” the back piece may be of calico or other cheap material. A coating (or coatings) of india-rubber solution or other suitable cement is applied to the under side of the face cloth; threads of india-rubber (in preference to a sheet) stretched in a corrugating machine are then laid on, and a back piece of calico coated with cement is placed on the threads. The whole is passed “through the ordinary pressing and” “crimping rollers” for the purpose of “pressing the parts” well together and of crimping it so as to enable the back “fabric or lining to corrugate evenly when the elastic fabric” is contracted.”

Sometimes “a reversible cloth with a cotton back” is found to be useful for a face cloth. Sometimes an “open texture” “face cloth” is used on both sides of the combined fabric; in this case there will be “an entire absence of corrugations both” “on the back and front.”

If desirable the face cloth “may be subsequently dressed” “and finished.”

[Printed, 4d. No Drawings.]

A.D. 1858, February 1.—No. 178.

HALL, WILLIAM KEMBLE.—(*Provisional protection only.*)—“Improvements in the manufacture of artificial leather.” The “constituents of leather” are combined to form a substance “resembling leather and applicable to the formation of boots” “and shoes, harness, trunks,” &c.

“The gelatine and fatty matters of the skin” are represented by “glue and grease;” “the tannic acid and mucilaginous” “matters by terra japonica.” The fatty portion of the composition is used “in the modified condition of soap, which” “occasions its solubility in water.” A woven or felted fabric is

impregnated "with this solution of leather as it may be termed" and is subsequently passed "through a solution of alum or other similar reagent, by which the entire material and its respective parts are rendered insoluble in water." The fabric known as undressed moleskin "is peculiarly applicable to this purpose." The surface of this artificial leather may be dressed with dubbing or be enamelled in black or colours.

[Printed, 4d. No Drawings.]

A.D. 1858, February 2.—No. 191.

WESTLEY, WILLIAM.—(*Provisional protection only.*)—"Improvements in the construction of heels for boots and shoes." The heel consists of "an entire or partial rim of metal" of the required shape and height and filled with "gutta percha, scrap leather, wood, or any other suitable material." Holes for attaching the heel to the boot or shoe "may be moulded or otherwise made" in the material. The rim may be japanned or otherwise finished; it may be "thickened up with steel around the bottom edge;" or it may be "made of cast-iron chilled or otherwise treated on the under edge."

[Printed, 4d. No Drawings.]

A.D. 1858, February 3.—No 194.

MORRIS, JOHN.—(*Provisional protection only.*)—"Improvements in boots and shoes." This invention applies more especially to boots and shoes worn by "puddlers, shinglers, and other workmen employed in iron works or in other places where the boots or shoes are liable to be exposed to heat or to chemical agents injurious to leather;" it consists in protecting the sole and heel by nailing or otherwise fastening thereto sheet iron or other hard infusible and cheap metal or alloy.

[Printed, 4d. No Drawings.]

A.D. 1858, February 23.—No. 351.

McLENNAN, WILLIAM.—"Improvements in the manufacture or production of boots, shoes, and other coverings for the feet." These articles are made for the most part with

"moulded gutta percha soles," and the moulding apparatus "forms an important feature in such manufacture."

A curved bar has its ends turned up at right angles and near its middle a hole for placing it on a vertical rod so that the apparatus may be placed in any required position. Each turned-up part carries an upper and a lower cross-piece, and the portions between are rounded and screw-threaded. The lower cross-pieces support "a skeleton mould or shaper which "is made in two parts," the parts being connected at the heel end by a pin and nut and at the other end by a band of vulcanized rubber or elastic material. The portions of the mould nearest to the heel part "are bevelled in the direction "of their length to admit of the two parts being opened or "distended at the opposite end;" the ends of the mould are passed over the turned-up parts of the bar and are held down by the upper cross-pieces. Above the mould "is fitted "a sole cover or holder;" it consists of a bar of metal whose under side "is shaped to the contour of the sole of the boot or "shoe;" its backward end is curved inwards to fit and partly encircle one upper cross-piece, while the other end is passed over the top of the other cross-piece; each end is held down by a nut. The two parts of the mould are brought together by a lateral screw, and "as regards horizontal adjustment, by "means of a projecting piece of metal" secured to one part by a screw; they are made to open for the admission of the last by means of a coiled spring which is secured in "a circular "recess made in each."

The last is of metal; the heel part "which is made to extend "beyond the upper" is hollowed out to receive the end of a screw from the horizontal portion of the curved bar. A bent spring, screwed to the inner portion of the last and having its upper part notched, presses against and holds in position the instep piece, which is a blade spring jointed to the last. The sole of the last has fitted to it and fastened to it by a screw a brass "insole presser," which prevents the insole "from "bulging upwards during the making." The toe part of the last is supported by another screw from the curved bar, the screw carrying pieces for the adjustment of the toe piece.

The patentee describes at length the process of manufacturing boots and shoes. He claims (1) attaching the upper to the insole by means of adhesive substance and cementing the outer

sole thereto; (2) perforating the turned-in part of the upper so that "a portion of the adhesive material used for cementing "the upper to the insole passes through the perforations;" (3) sometimes dispensing with a leather insole and uniting the upper and the sole by the gutta percha which passes through the perforations in the upper; (4) forming the heel stiffenings of gutta percha moulded in the apparatus.

[Printed, 8d. Drawing.]

A.D. 1858, February 25.—No. 378.

MIDDLETON, SAMUEL.—"Improvements in the uniting or "seaming articles of leather, and in the apparatus connected "therewith." The uppers and soles of boots and shoes are united by means of short metal pegs triangular or square in shape, pointed at each end, and barbed on the edges. The pegs are passed through the two inner parts or faces of the pieces to be joined and are then hammered or pressed until the faces of the pieces are brought close together. The pegs may pass either partly or wholly through the pieces; if wholly the points form heads at each end. The pieces are worked in a wet state; the leather as it dries contracts tightly round the barbs.

The upper is mounted on an iron-faced last; both are put into an iron mould cast in two parts; an insole is laid on; and clams stretch the upper flat over the insole. The clams have two rows of holes drilled through them.

The pegs are applied to the upper and insole by means of a "metal peg-die," which fits on to the last and is drilled through correspondingly to the clams, "but designed to hold "lightly just one half of the pegs, leaving the other half "ready to enter" the upper and insole through the holes in the clams. The pegs are held steady in the die by small spiral springs. The construction of the die is explained in the Specification.

The die, last-mould, &c. being put into a press and pressure being applied, the pegs enter the upper and insole "to the extent of one half;" the clams and the die are taken away, and the leather is left to dry. The outer sole is then put into the press; pressure is again applied, and the projecting portions of the pegs enter the outer sole and complete the fastening.

The outer sole may be cut out (whilst being fastened on) by means of a steel cutter fitted on to the bottom of the last-mould.

Heels are affixed by means of pegs of a somewhat larger size.

[Printed, 2s. 4d. Drawings.]

A.D. 1858, March 4.—No. 431.

DEWAR, JOHN.—(*Provisional protection only.*)—"Improve-ments in the manufacture of boots and other coverings for the feet." This invention relates to a "simple, economical, and effective system of cutting out and forming to shape the upper leathers."

The uppers are cut out of a flat piece of leather to the usual external contour, "the leather being cut double so as to insure accuracy of form." Each upper includes the whole of the leather required, "the quarters being allowed for" in the upper. Each is cut through "at the two ankle portions," so as to form "an inclined or sloping slit on each side." The leather is then crimped to form the instep portion to the required shape on a crimping block. The slotted portions at the ankles are filled up with elastic gusset pieces or otherwise, and the leather is then ready "for sewing up at the extremity of the heel and for the attachment of the sole."

[Printed, 4d. No Drawings.]

A.D. 1858, March 13.—No. 511.

PARMELEE, SPENCER THOMAS.—"A new mode of combining certain materials to be used in the manufacture of boots and shoes," with a view "to their being rendered impervious to moisture and stronger and more finished in appearance" than by the methods of cementing or coating at present in use.

The material is cut or moulded into shape for making the upper. Thin cloth coated on both sides with india-rubber or gutta percha is cut into the shape required for forming an interposing or "cloth foxing." A layer of india-rubber or gutta is cut into similar shape. The coated cloth and the foxing of india-rubber or gutta percha are laid upon the outer surface of the material, and the whole "is placed between

“smooth metallic surfaces and submitted to heat and pressure for a few seconds.” The india-rubber or gutta percha [is rendered soft and plastic, “and a perfect adhesion or union of the foxing to the upper obtained without the employment of solvents as at present.” The cloth foxing is sometimes dispensed with.

[Printed, 6d. Drawing.]

A.D. 1858, March 17.—No. 543.

GOODERHAM, JOHN. — (*Provisional protection only.*)—“Improvements in shoemakers’ wax.” This wax which has “all the advantages of ordinary wax” and renders the thread “more durable, easier in working, and more tenacious in its hold,” is composed of gutta percha 20 parts, pitch 58, soap 5, resin 6, beeswax 5, palm oil 1, and tallow 5 parts or thereabouts.

The gutta percha is dissolved by heat; the other ingredients are added thereto, one after the other; the heat is kept up at such a temperature during the mixing that the component parts may be thoroughly incorporated with each other; the mass is then allowed to cool and is afterwards formed into balls or cakes.

The “beeswax, soap, palm oil, or tallow,” may be left out as “not absolutely essential.”

[Printed, 4d. No Drawings.]

A.D. 1858, March 24.—No. 615.

CHEVALLIER, CHARLES, OLIVIER, MARK ISIDORE, and ROLLAND, EUGENE. — “A machine for making and applying, “as soles to shoes and boots, gutta percha, caoutchouc, and “other analogous substances adapted for that purpose.” The two principal parts of this machine are a curved pressure roller and a metal mould made in two parts “to admit of the “last with the upper thereon being placed therein, after “which the two halves of the mould are forcibly pressed “together and held in that position” by screws. The outer edge of each half of the mould is of the same curvature as the sole is to have.

An upper shaft, set in motion by a crank handle or other power, carries the pressure roller, two spur wheels, and two

pulleys, one of each on each side of the roller; a lower shaft carries two spur wheels (gearing into the upper ones), two pulleys (connected to the upper ones by endless bands), and two rollers of such diameters as to admit of the edges of the mould being introduced between them and the pressure roller.

The mould, containing the last with an upper thereon and the substance (previously made plastic) of which the sole is to be formed, is placed between the rollers; the machine is set in motion; the mould is advanced under the pressure roller, and the sole becomes firmly united to the upper. "Any excess of material becomes squeezed over the edges" of the mould.

[Printed, 10d. Drawing.]

A.D. 1858, March 26.—No. 639.

BÉRARD, PIERRE HIPPOLYTE GUSTAVE.—"Applying concentrated collodion to the effect of superseding caoutchouc in waterproofing stuffs of all descriptions for manufacturing garments and wearing articles, and also for applying it over painted surfaces instead of varnish." For making 1000 parts in weight of this "waterproofing concentrated collodion" 425 parts of ether, 175 parts of azotic cotton, 375 parts of castor oil, and 25 parts of colouring matter are mixed together. The proportion of castor oil or any other oil or fatty matter may be modified according to the degree of suppleness required; and when the coated stuff is intended "for an imitation of leather, either for shoes, boots, or any other article," the patentee "would put into the mixture, two, three, or four per cent. of oil, as may be required."

The application of the mixture is effected "by the usual process and apparatus employed for manufacturing cerecloth or for applying caoutchouc over tissues." From 4 to 6 coatings, each "applied very thinly," are usually required, and each must be perfectly dry, before another is laid on. The fabric is finished by pressure "between hot figured rollers at a temperature from 100° to 115° Fahr."

Papers, coated with the above-described mixture and figured by rolling "at a temperature of from 104° to 123° Fahr., are rendered waterproof and suitable for manufacture into various objects, among which the patentee mentions jewellery cases.

[Printed, 4d. No Drawings.]

A.D. 1858, April 15.—No. 820.

NEWTON, WILLIAM EDWARD.—(*A communication.*)—"Improvements in boots, shoes, and other coverings for the feet." The sole or half sole is formed of a shell of "wire cloth or perforated metal stamped out to the form of the sole and turned up at right angles at the edges." The shell is coated on both sides with vulcanized rubber in a plastic state, and the whole is subjected to pressure in a mould to insure the union of the rubber with the metal, and is afterwards submitted to heat "in order to harden the plastic material." When the sole extends the whole length of the foot or is of extra thickness, it is convenient "to joint it at some part" to increase its flexibility. The sole is fastened on by screws or otherwise, and the heel is then put on. If a "moulded hard rubber heel" with an "elastic cushion" is used, it had better be applied "while in a green state" and then be hardened.

A modification, wherein the inner sole "is made of perforated metal or wire cloth covered with vulcanized or hard rubber."—Upon this sole is placed the outer sole "composed of a shell of metal coated as before described, but having its central part filled in with cork or other light material." Projecting from the shell are steel pins, "over which a covering of vulcanized india-rubber is to be placed." The sole is then to be stoved to harden the vulcanite. The pins "will take the wear of the boot or shoe."

Improvements "specially applicable to clogs and goloshes":—1. The back of the heel part is stiffened by a spring "curved so as to have a tendency to project inwards slightly." The spring bears against the boot or shoe, and by means of a pin attached to it or to the heel of the boot or shoe insures "such a connection as will prevent the clog from coming off accidentally."

2. The clog or golosh is made "with only a small portion of upper;" it consists of a sole, a toe piece, and a narrow upper extending all round "and rising in the form of a band at the heel to about the level of the upper of a shoe." The raised part may be stiffened by the insertion of a metal plate. The fastening is a strap and buckle attached to the band and passing over the instep.

[Printed, 10d. Drawing.]

A.D. 1858, April 16.—No. 827.

WALKER, GEORGE. — “An improved union apparatus for “cleaning and polishing knives and forks and boots and “shoes, and which said apparatus is also applicable for “sharpening knives and sharpening or cleaning other “articles.” The apparatus is composed principally of discs faced with suitable materials and revolving on a spindle; the spindle is mounted on a cast-iron or other stand which is covered with a case.

The part which is applicable for cleaning and polishing boots and shoes is mounted on the spindle outside the case. On either one or both sides of the projecting spindle are placed grooved or plain-faced pulleys; these by means of bands or gut give motion “to one or two brushes fitted between “suitable poppets” which are fixed on the stand; by this means “rapid and contrary motion” may be given to “two “revolving brushes arranged with suitable hair or bristles “for cleaning, blacking, and polishing boots and shoes.”

For the purpose of “imparting an elastic pressure” to the brushes, there is “a square shank on the inner ends “of the spindles,” in order that “a helical spring may “be placed on the shank between the inner surface of the “brush-stock and the bearing of the spindle.”

A cog wheel may be placed on the spindle; it may be thrown out of or into gear with a pinion, on the face of which may be a socket or pin for the application of a brush. By this means “the velocity of the brush” may be increased for polishing boots and shoes and other articles.

[Printed, 1s. Drawing.]

A.D. 1858, April 24.—No. 904.

STOCKER, ALEXANDER SOUTHWOOD. — “Improvements apper-
“taining to articles to be affixed to boots and shoes and to the
“feet of animals, and in the machinery and means employed
“for producing the same.” The first part of this invention
consists in making soles and heels of a combination of iron
or other metal with leather, gutta percha, or other sub-
stance:—A sheet of the substance is reduced by rolling or
otherwise to the required thickness, and is then cut up into
soles or heels by means of a pair of cutting tools fixed in

a press. The sole or heel is transferred to another press in which tools pierce in it "round holes of any desirable diameter" for the insertion of metal plugs. The plugs are forced into the sole or heel with their points outwards; their heads are pressed flush with the inner face of the sole or heel, and their points may be left projecting or be hammered flush with the outside. These soles and heels may be fixed to boots and shoes in any of the ordinary ways.

The second part relates to the manufacture of metal tips and toe pieces known as "York grooved heels, grooved solid back or bitted heels, flat or Scotch heels and toes :"—They are made from "slit rods," cut into lengths and bent in the ordinary manner; they are then heated to a suitable temperature, placed in "a mathematically and truly sunk die which is fixed in a stamp," struck in order to rebend them correctly, placed in "another corresponding die of equal precision," and receive "an instantaneous smart heavy blow with a steam or other hammer." The top die must be of "a convex form" in order to "turn out the heel nice and hollow" so as to fit properly the boot. "Rolled rods" may be used for making any of the articles.

Solid back or bitted heels have the back filled up with a piece of steel or other metal. Indentations for nail heads are stamped "in straight lengths of iron." These goods are finished by the aid of steel or other metal wheels "cut as files are cut," also by the aid of stones or stone wheels.

[Printed, 10d. Drawing.]

A.D. 1858, April 26.—No. 918.

MARTIN, WILLIAM ARENA.—(*Provisional protection only.*)—"An improved shoe scraper." This scraper is circular and capable of revolving. When intended for use indoors the wheel or scraping part revolves on a spindle which is fixed in a pan to receive the dust; otherwise it is made "without a pan for fixing in stone or bracket to bolt to a wall." The wheel varies in size; a wheel "eleven and a half inches in diameter" is "a good size;" the largest, fifteen inches in diameter, "is found to answer well." By making the pan "long on one side" an umbrella stand or bracket may be added.

[Printed, 4d. No Drawings.]

A.D. 1858, April 29.—No. 952.

BARTLETT, STEPHEN.—(*A communication.*)—(*Provisional protection only.*)—"Improvements in machinery for forming "gutta percha soles and uniting them to the upper leathers "of boots or shoes." Two metal plates of nearly the same shape as the sole are connected by bolts and nuts or other equivalents. To the upper plate "is fixed the covering of the "shoe on its last," and to the lower one is attached a "metal-lic mould having internally the shape of the sole and heel." The mould is filled with gutta percha in a semi-fluid state; heat is then applied to the mould, and the mould "is immediately "screwed up tight against the under side of the last and "allowed in this state to cool."

[Printed, *4d.* No Drawings.]

A.D. 1858, April 30.—No. 968.

ELLIS, GEORGE HENRY.—"Improvements in cleaning boots " & shoes by machinery, & in apparatus for the same which is "also applicable to cleaning other articles in domestic use." In this apparatus the brushes receive "reciprocating motion," whereby "the frictional contact produced is alternately in "opposite directions and is in some degree assimilated to the "action of hand cleaning."

Three sets of brushes are mounted in slides; one acts on the front part of the boot or shoe, one on the sides, and one on the heel and back part; they are made "in parts hinged to "each other and acted on by springs so as to collapse and "grip the surface to be cleaned as closely as can be." Another set for applying the blacking may be used, but it is preferred to apply the blacking with a hand brush.

The boot or shoe may be presented to the brushes by hand, or it may be mounted "on a kind of tree which is supported "in an upright frame." The tree consists of a last supported by a tube "forming the body of the tree;" the tube slides "within a tube secured on the cross bar of the frame," on which it is "free to oscillate." The outer tube is filled with small shot; it is furnished with a throttle valve "to retain the shot "therein or permit it to descend through the lower tube." The last is enclosed in a vulcanized rubber sock, the ankle of which is tied tightly round the lower end of the lower tube.

The boot or shoe is placed on the sock and last, "swinging" the tree in suitable position for the purpose;" the valve is opened; the shot descend, expand the sock, distend the boot or shoe, "remove all wrinkles, and present a plump surface" to the brushes.

The blacking (in a fluid state) is contained in a vessel, wherein is a pad fixed to one end of a swinging lever; the other end of the lever carries "a surface" which comes into contact with the blacking brush when the latter is thrust through an aperture in the vessel.

The connecting parts of the machine, the mode of working it, and sundry modifications of certain parts, are explained in the Specification.

[Printed, 1s. 2d. Drawings.]

A.D. 1858, May 6.—No. 1008.

SCOTT, EDWARD JOHN.—"Improvements in the manufacture of boots and shoes." This invention relates especially to the method of attaching gutta percha soles, although it may be adopted in the case of leather soles.

The attachment is effected by means of gutta percha pegs (by preference) shaped like screws to give them a sufficient hold. The upper, having its edges turned over and attached to the insole and having the surface to which the sole is to be fixed covered with adhesive material, is placed upon a small last. A loose piece of gutta percha is laid between the insole and the last. Holes are punched through the overlapping portions of the upper and the edges of the insole, and the holes "are made to assume the form of internal screws by means of a screw tap." The upper and insole are taken off the last; the loose piece of gutta percha (which prevented the punch from coming against the last) is removed, and a softened gutta percha sole being placed in a metal sole mould is moulded on "in the usual way," namely, by screwing the boot or shoe down on it. Portions of the softened gutta percha are "forced by the pressure into the holes" and assume "the shape of screws." The process "may be modified in various ways."

If the sole is of leather, it may be attached to the insole and upper "previously perforated and charged with gutta percha." Or the sole also may be perforated, and the whole may be

held together "by gutta percha pegs or screws formed by
" pressing gutta percha in a soft state into the perforations."

[Printed, 4d. No Drawings.]

A.D. 1858, May 7.—No. 1025.

NEILSON, ARCHIBALD. — (*Provisional protection only.*)—
" Improvements in the manufacture of boots, shoes, and other
" coverings for the feet," when such coverings are made with
gutta percha, or gutta percha composition, or moulded soles.

The upper surface of a metal sole plate, "of the dimensions
" suitable for a shoe sole," is formed "to a fine surface cor-
" responding to the face of the intended sole and heel." This
face is channelled all round the contour of the sole to receive
" a corresponding frame of metal hinged at one end to the
" sole plate, and in one or more pieces, as may be convenient."
This frame has upon its upper surface "an angle or ledge
" piece for forming the seam at the junction of the sole with
" the upper;" its "main inside edge face shapes the external
" contour of the sole edge."

The workman deposits a sufficient quantity of the softened
gutta percha on the face of the sole plate, places the lasted
upper down upon it, and then "shuts down the open moulding
" frame;" this at once moulds the sole and firmly attaches it
to the edges of the lasted leather. The heel portion "may
" also have an open moulding frame, but this is not essential."

[Printed, 4d. No Drawings.]

A.D. 1858, May 8.—No. 1036.

NEWTON, ALFRED VINCENT. — (*A communication.*)—"An
" improved manufacture of hard and waterproof fabric, and
" the application of the same to the construction of boats,
" parts of carriages, and of furniture, portmanteaus and tra-
" velling cases, and vessels of capacity." This fabric is appli-
cable to the manufacture of "shoe soles." It consists of
woven wire cloth coated on both sides with india-rubber vul-
canite compound in a plastic state.

If the wire cloth is coarse, and it is desired "to cover it
" cheaply," it is placed between two sheets of the compound,
and the whole is passed between calender rollers; the sheets

will adhere between the meshes of the wire "without the wire "cutting the compound." If a smooth surface is desired, the wire cloth "is to be more thickly coated," and the vulcanite compound is to be "spread upon it in the same manner as "upon cloth with calender rollers."

[Printed, 4d. No Drawings.]

A.D. 1858, May 29.—No. 1217.

HENRY, MICHAEL.—(*A communication from J. B. Vasseur and A. Houbigant.*)—"Improvements in and in preparing "agents for dyeing, preparing for dyeing, and tanning, and "applying certain of the resulting products for obtaining "pulp for paper and pasteboard, and the manufacture of "blacking." The inventors employ "concentrated baths" of (1) vegetable matters containing resinous substances and tannin, "treated or not with acids or chlorine," (2) vegetable matters containing resinous substances, but no tannin, treated with acids or chlorine, (3) vegetable matters containing a bitter principle, treated with acids or chlorine, for dyeing and preparing for dyeing.

"The fibrous and filamentous residua of the baths" are applicable as pulp for paper and pasteboard. "The decoctions "are evaporated," and "the deposit of the decoctions containing tannin, combined with a salt of iron and gum or "treacle, forms a serviceable blacking."

[Printed, 4d. No Drawings.]

A.D. 1858, June 1.—No. 1228.

BARCHOU, ALFRED.—"A heel for boots and shoes." The heel is made of leather; it is hollow, being "stamped, "squeezed, or pressed out of one piece of leather, including "the bottom." The hollow is filled with "gutta percha, "wood, india-rubber, cork, or leather, made into paste or "solid." Other substances may be used according to the weight and strength required. The heel is fixed on by sewing, serewing, riveting, or other suitable means. Sometimes the stamped-out bottom is taken off, and another top piece is put on.

[Printed, 4d. No Drawings.]

A.D. 1858, June 3.—No. 1249.

NEWTON, ALFRED VINCENT.—(*A communication.*)—"An improved manufacture of woven fabric applicable chiefly where strength and durability are required." This fabric is intended as "a substitute for leather or vulcanized india-rubber cloth in the making of bands for machinery, soles for boots and shoes" and like purposes. The improvement consists in weaving the warp threads in reference to the filling threads in a peculiar manner."

In one mode of weaving "each of the respective sets of filling threads is united by a double set of warp threads to the filling threads on each side thereof." In another, each set of warp threads "turns around the outer filling threads" and crosses "all the other warp threads diagonally." In each mode "there are no straight warp threads in the fabric."

"A thickness of four, five, six, or more cotton or linen filling threads and twelve warp threads" can be readily worked on any jacquard loom, and a fabric can be produced "of sufficient strength, thickness, and uniform firmness of texture throughout" to serve for the above-mentioned purposes.

The fabric is rendered waterproof by saturating it with a solution of caoutchouc or resinous matter.

[Printed, 6d. Drawing.]

A.D. 1858, June 4.—No. 1261.

CRICK, THOMAS, and CRICK, JOHN THRONE.—"Improvements in the manufacture of boots, shoes, and slippers." The improvement refers to the lasts or shapes employed. The last is so constructed that when an upper is fixed thereon, the required straining of the leather can be effected without the aid of pincers.

The last consists generally of three parts; a front, a hind, and an intermediate part. It is convenient to have the front part attached "by a plate or other means to a bench or other stand" so that the last may rotate. The hind part moves "on a hinge or otherwise from the front or main part." The intermediate part slides between the front and hind parts by means of a rack and pinion, or "an axis and cam" moved by a weighted handle, or a screw, or other convenient means.

The upper, having been previously "run round with a string " or cord near the edge so as to draw it in or contract such " edge," is placed on the last (the insole being first fixed on the front part), when the front and hind parts are near together. The hind part "is moved back," so that the upper "is stretched " and held fast to the last." The upper when placed on the last "is held on either side by a bent spring."

The last is made by preference of cast-iron with wood let into the sole for the reception of the nails required for fixing the insole thereto; it "may be varied in the mode of expand- " ing or separating the parts;" it may consist of two, three, four, or more parts."

[Printed, 10d. Drawing.]

A.D. 1858, June 18.—No. 1380.

SPENCE, WILLIAM. — (*A communication.*)—(*Provisional protection only.*)—"Improvements in clogs, shoes, or sup- " ports for the feet." The sole is of thin metal hinged to give it flexibility. At the hinder end there is a shell of leather or metal into which the heel is fitted, and at the fore part a toe piece of either leather or metal. "A blade or skate of metal, " corresponding with the form of the shoe and hinged like the " sole, is riveted or otherwise fastened to the latter." On each side of the sole at the hinder part there is a lug, into which is inserted a stud for the purpose of holding each end of a strap for confining the foot. "A small plate of metal is " inserted in the strap, such plate of metal having in it a hole " to receive a connecting button or stud, and the connection " between the end of the strap and the ear or lug is hidden " by means of a covering button."

[Printed, 4d. No Drawings.]

A.D. 1858, August 10.—No. 1818.

BARCROFT, ALFRED. — (*A communication.*)—"Improve- " ments in the mode of fastening the soles and heels of boots " and shoes." The fastenings employed are "threaded nails, " spindles with rings, ringed mandrils, or any similar articles " though coming under a different denomination, and made in " any metal, and of any size or shape, and with or without " heads;" they may be termed "grooved rivets." The stem

is of "a conical or pyramidal shape" with lines or rings cut thereon parallel to each other; it may be of other shape, but the conical is preferred "for general purposes in connection with boots and shoes."

The fastenings are sharply driven through the parts to be joined together by means of a hammer or other pressure and are then clinched on the inner side or on both sides according as they are made with or without heads.

[Printed, 4d. No Drawings.]

A.D. 1858, September 3.—No. 1997.

BELLANGER, JEAN MARIE.—"Caoutchouc socks or clogs with springs and without bridles." The last on which the golosh or clog is made is "very much arched or curved" in order that the golosh "may retain the same shape when removed." Before the outer sole is put on, a spring of tempered steel or other suitable metal is placed longitudinally upon the insole; the outer sole is then attached, and the spring is secured between the two soles by nailing or riveting. The spring may consist of two or more pieces if desirable. A metallic stud projects from the heel about one-eighth of an inch for the purpose of readily removing the golosh from the foot.

Goloshes thus made adhere firmly to the boot or shoe without straps or other fastenings.

[Printed, 6d. Drawing.]

A.D. 1858, September 18.—No. 2105.

LUIS, JOZÉ.—(*A communication*).—"Improvements in the application of gutta percha for clogs, galochees, & shoes & boots, and for the apparatus connected therewith." These articles are made "in a single piece without seam." The moulds used are of metal or wood coated with metal or of any hard material capable of retaining a polish. The gutta percha is reduced by a gradual heat to a liquid or half-fluid state and is run into the moulds, when "by means of a common screw press adapted to the moulds" it is forced "to spread itself equally in all the empty parts." The buttons and button holes or other fastenings are added, and the blacking or varnish used for leather is applied.

The articles "have a double or only a single sole according to the strength to be given." The sole "is made thinner from the heel to the fore part of the foot so as to permit the easy bending" of the material. "Hidden grooves" are arranged in such manner that "the shrinking produced by heat is no longer an inconvenience." The heel is "moulded at the same time as the rest."

[Printed, 6d. Drawing.]

A.D. 1858, October 8.—No. 2244.

FELTON, ALFRED.—(*Provisional protection only.*)—"Improvements in instruments used for inserting & fixing metal eyelets." Cutting edges are applied to the punch of spring nipper eyelet fasteners, so that, when closing the nipper on the eyelet, the cutting edges "sever the lip of the eyelet at first when it is being turned over, causing it to separate at several places, whereby the turning over is more uniformly effected."

The instrument may be so formed as "to complete the operation of fixing the eyelet," but the inventor prefers that it should be used only "for cutting and partially turning over" the eyelet, and that "the ordinary nipper eyelet punch" be used "to complete the operation."

The cutting edges are made "on the cone-like form" of the punch; or this part may be made "hollow with radial slits therein," through which the cutting edges are projected.

[Printed, 4d. No Drawings.]

A.D. 1858, October 29.—No. 2413.

KIRRRAGE, WILLIAM.—"An improved elastic combination of materials impervious to atmospheric influences, as a substitute for hard woods, metal, leather, or felting, and for other purposes." The combination consists of india-rubber, gutta percha, tar, and sulphur, "with certain other ingredients according to the purposes for which the compound is required." The ingredients are "masticated so as to form without the use of any solvent except heat a fine plastic substance."

When the compound is to be used for outer soles of boots and shoes or as a substitute for heavy leather, the ingredients

and proportions are 16 lbs. of india-rubber, 25 lbs. of tar, 48 lbs. of finely powdered chalk, 16 lbs. of hemp, and 10 lbs. of sulphur. When the rubber is "brought into a state of pulp" in a masticator, the other ingredients are added and thoroughly incorporated with it. The compound is then put into moulds and hardened by the action of steam "of from thirty to fifty pounds pressure on the square inch" or by means of heat (300° Fahr.) for a longer or shorter period according to the degree of hardness required.

[Printed, 4d. No Drawings.]

A.D. 1858, November 2.—No. 2446.

KYLE, DAVID DUNNE. — (*Provisional protection only.*)—"Improvements in boots and shoes." The improvement consists in "a method of adjusting boots and shoes to the instep and adjoining parts of the foot" so as to obtain any required degree of pressure.

Screws, attached to or inserted into the heels or soles and "working or not as may be required in nuts, pinions, or other gearing," are connected with the uppers or sides by straps or wires "passing over or through pins, pulleys, or grooves in the heels or soles;" a tightening or loosening effect is thus produced, when the screws, &c. are actuated. Boxes may be placed in the heels or soles, "through which to apply the screw driver or key," and the apertures can be stopped with plugs as in riding boots.

"Some of the above parts may be elastic or inelastic as required," and "springs may be connected with them or cushions attached." India-rubber or other elastic water-proof material is inserted where necessary.

[Printed 4d. No Drawings.]

A.D. 1858, November 10.—No. 2518.

CORNER, JOHN.—"Improvements in machinery for making metallic screw rivets, and for uniting with them parts of boots, shoes, portmanteaus, leather hose, buckets, harness, and other leathern articles." The machinery is of the following description:—On a head plate are fixed two headstocks. One carries a bobbin (on which wire is coiled) and a chuck whereon are mounted four rollers, "having milled grooves for the purpose of advancing and turning round the

“ wire.” The other carries a tool-holder on which three cutters are mounted. The wire advances through the cutters, and revolving at the same time has a thread formed on it. This headstock also carries the shears which are actuated “ by “ a cam fixed on a revolving shaft.” The length of the rivet cut off is varied “ by altering the position of a band upon two “ cone pulleys, so as to vary the speed of the cam shaft.” Provision is made “ for stopping the screwing motion while the “ cutting-off is being performed,”

The screwed wire advancing and revolving at the same time, the boot, shoe, or other article “ need merely be held steady “ with a previously drilled hole opposite the advancing wire”; this will make its way in, and when a sufficient length has penetrated, the shears perform the cutting-off. The last of the boot or shoe must have a plate of iron attached to the sole for forming the head of the rivet.

The chuck (of steel or wrought iron) “ has an internal thread “ corresponding to the thread on the coil carrier, on which it “ is screwed, and by which it is driven”; it has two grooves (at right angles to each other), “ into which are fitted the four “ carefully turned steel rollers.” The grooves of the rollers are “ turned in the centre of the body”; they are milled and so shaped that “ they grip and slightly flatten the wire” in passing through.

Three methods of cutting-off the rivets are described:—In the first two steel discs are used; one is stationary, the other moveable; each has a central hole in it. The moveable disc is actuated by a lever, and the discs are caused to advance with the wire by a “ curved wedge” screwed to the lever. In the second, cutters slide in the grooves of “ a coverplate” by the action of a “ double eccentric cam.” In the third (suitable for large wire or for cutting the rivets “ very close to the work”) the cutter plate “ is attached by a hinge to the headstock”; the cutters “ are inclined,” are screwed to moveable blocks, and are caused “ to approach and pass” by a cam. The curved wedge is used in the second, and may or may not be used in the third.

The specification contains a very detailed account of the machinery, and a description of a machine for marking and indenting leather equidistantly, but not claimed by the patentee.

[Printed, 1s. 10d. Drawings.]

A.D. 1858, November 12.—No. 2541.

TURNER, DAN.—(*Provisional protection only.*)—"Improvements in the manufacture of wood soles for clogs, boots, and shoes." Each block is cut into two pieces in such manner as to leave a projection on the under side of each piece to form a heel. The portion of each piece beyond the heel is bent by suitable discs or plates, so as to obtain "the requisite hollow in the middle and the rising of the fore part." The wood before being subjected to pressure is steamed, and when it is set to the desired shape, it is finished off at the edges and other parts "by cutting as heretofore."

This method obviates the necessity of cutting the grain of the wood across, and renders the toe or fore part of the sole less liable to be broken.

[Printed, *4d.* No Drawings.]

A.D. 1858, November 13.—No. 2545.

WADSWORTH, JAMES.—"Improvements in the construction of moveable or adjustable heels for boots and shoes, and of spurs adapted thereto and to be used therewith." The moveable portion of the heel is united to the fixed part by a ring affixed to a plate (which is screwed to the boot or shoe), and by a disc which forms the foundation whereon the heel is built.

"The inner edge of the ring and the outer edge of the disc" are made with corresponding flanges and blank spaces, so that the ring and disc can be locked together and loosened by turning the disc. A tongue or blade spring is riveted at one end to the plate; the other end is free, and when the ring and disc are locked, takes into one of "broad shallow grooves or recesses crossing the disc diametrically between opposite pairs of the blank spaces," thereby preventing the disc from turning. To remove the moveable portion, the tongue must be raised from its groove; for this purpose there are "bevelled indentations at the ends of the grooves" to admit a pin or wire.

[Printed, *8d.* Drawing.]

A.D. 1858, November 29.—No. 2716.

HENRY, WILLIAM ARTHUR.—"Improvements in machinery or apparatus for attaching the soles and heels of boots and shoes to the upper leathers, and in the fastenings employed

“ for that purpose.” The first part of this invention relates to an apparatus which “ is divided into two main parts, namely, “ the shoe-holding and actuating frame, and the screw-inserting “ mechanism.” Two uprights of an outer frame serve as guides for a vertically sliding frame which is adjustable as to width. Within the sliding frame a hollow cylindrical holder slides in a horizontal direction; it carries on its upper and under surfaces grooved sliding blocks which allow the holder to be “ slid to and fro” in a “ lateral direction,” and to have also “ angular adjusting movement.” Within this holder is another holder of like shape, capable of turning therein by means of a toothed wheel, pinion, and handle, at the outer end. The inner end of the inner holder is formed to receive a block of wood which pivots between two centre pins, so as to assume any required angle. The last of the boot or shoe is fixed in a recess in the block by means of a spindle which passes through the holders, and is tightened-up by a hand-nut. The weight of the sliding frame and its appendages is balanced by a counterweight. The sole of the last is of metal, and against it are placed the inner sole, the edges of the upper leather, and the outer sole, all held in position by a “ rest or support-
“ ing and pressing tool,” the construction of which is described in the specification.

In the screw-inserting part, a rotating spindle is capable of sliding longitudinally during its rotation. At its inner end are nippers for holding the fastening which is to be inserted; they are actuated “ by a pair of double-headed slotted pliers which “ grip two collars carried by the spindle”; one collar being fast thereon enables the spindle “ to be slid to and fro”; the other being loose slides along and revolves round the spindle. The loose collar is linked to one jaw of the nippers, and by its motion causes the jaw to open or shut.

Two fastenings are described; the one consists of “ a short “ length of wire twisted or coiled into a helical form so as to “ resemble the worm of a corkscrew,” the other of a screw of wire “ slightly tapering with a gimlet point.” These fastenings make their own holes in the soles; if ordinary screws are used, holes must be made in the soles to receive them.

The gearing, &c., required for the apparatus is explained in the specification.

[Printed, 1s. Drawing.]

A.D. 1858, December 7.—No. 2804.

SCARBOROUGH, JOHN VICKERS.—“Improvements in apparatus for the manufacture of boots and shoes,” the soles and heels of which are of gutta percha. Standards carrying an upper and a lower cross rail are bolted to a counter or bench. At uniform distances vertical screws work through collars in the upper rail, while their lower ends (somewhat smaller in diameter) rotate through holes in the lower rail. Each screw passes through a tapped “bent presser bar,” which “is raised “ or depressed according to the direction in which it is caused “ to rotate ” by means of a hand wheel fitted to the upper end of the screw. The front end of each presser bar “is bent “ outwards and forms a right angle with the vertical part.” A screw passes through this end carrying “the front presser “ piece,” which is curved “to fit the front part of the last, so “ as to press closely and firmly down upon the upper without “ indenting or marking it.” The back end of the presser bar “ is widened out laterally, so as to obtain a good firm bearing “ on the upper part of the last.”

The mould is by preference of lead or other soft metal ; the interior is shaped to the exact configuration of the intended sole and heel ; the surface of the bottom is made quite smooth “ to give a good surface to the finished sole.” Two holes are made through the metal to allow of the escape of air and of any superfluous gutta percha. The edges of the sole are formed by “moulding brasses,” consisting of two thin strips of brass “which are bent to fit closely to the walls of the “ mould” ; one strip extends from waist to waist round the toe, the other round the heel. Where the ends of the strips meet, each strip has attached to it a laterally projecting piece, “ which extends outwards over the edge of the mould on each “ side,” and serves as a handle “to lift the brasses out of the “ mould before removing the boot or shoe therefrom.” The lower edges sink into a groove made round the edge of the sole part of the mould ; the upper edges are turned inwards at right angles ; the “turned part moulds the upper edges of the “ sole and heel, forming a neat finish at the part where the “ sole and heel join the upper.” The moulds are arranged in a row, one under each presser ; the holes are placed over vertical apertures in the bench for the escape of the surplus *gutta percha*.

The last (of wood) has round the edge of the sole a groove in which is laid a strip or band of vulcanized rubber secured at the middle, toe, and heel by "brass clipping pieces." This band "presses the upper well into the moulding brasses, and "this avoids any escape" of the gutta percha "along the "upper edge of the sole." A metal upright is screwed to the upper part of the heel; an eye in its upper end holds a short bar which aids in removing the last and completed boot or shoe from the mould.

The working of the apparatus is described.

[Printed, 10*d*. Drawing.]

A.D. 1858, December 11.—No. 2842.

GUTHRIE, JOHN BONAR.—"Improvements in the manufacture "of india-rubber overshoes." The object of this invention is to render "semi-elastic overshoes more elastic at certain parts." Elastic gussets "of woven elastic fabric" and of a suitable size are inserted into the instep or the side or sides of the overshoe. The gussets are secured either by sewing to the india-rubber or to the lining or to both, or by cementing between the rubber and the lining. Or the overshoe may be prepared to receive the gussets "by making an extra lap of rubber or "rubber and cloth round about the gap in the shoe" left when it is being made; the lap serves to enclose a portion of the gusset and to conceal the edge. An elastic strap passing over the instep serves to attach the overshoe.

[Printed, 4*d*. No Drawings.]

A.D. 1858, December 28.—No. 2965.

BROWNE, BENJAMIN.—(*A communication.*)—"Improvements in the manufacture of boots and shoes or other "coverings for the feet, and in the mode or method of uniting "the same or parts thereof." The first improvement "is "more especially applicable to that class of boot or shoe "called bluchers;" it consists in cutting "the lower and "outer" portion of the quarter "longer than the top or "middle part at the point or place of junction," so that it is made to overlap the piece through which the tie is passed. By this method the boot or shoe "is made stronger in consequence "of the strain being taken off the stitching direct."

The second consists in uniting to the upper "a strip of leather, canvas, or other suitable material;" this in some cases is made "to form a side lining;" it may be "continued along and around the upper and waterproofed." The "chief advantage" of the strip is that "the prime part of which the front or upper is composed can be made smaller in size, as this piece serves as a portion to be taken hold of so as to draw the upper well on to the inner sole;" it may be of sufficient size to overlap and "form in fact a substitute for an inner sole."

The third consists of an improved mode of connecting metal tips to boots and shoes; the mode is not described in the Specification.

[Printed, 8d. Drawing.]

A.D. 1858, December 28.—No. 2971.

JOHNSON, JOHN HENRY.—(*A communication.*)—"Improvements in the manufacture of boots and shoes or other coverings for the feet." 1. "Cutting or punching out the soles so as to produce bevelled or inclined edges at a single operation:"—A punch, having a curved cutting edge of the form of the sole, is attached to a plate which is guided by pins; under the punch is a cutting block convex on its upper surface. Or the punch may be "straight upon its cutting edge" and cut the sole upon a flat surface whereon is placed a convex block of such size as to fit inside the punch. Guide pins in the block determine "the proper position of the parts in relation to each other," and a block of caoutchouc regulates the pressure upon the leather.

2. "Bevelling, reducing, skiving, shaping, buffing, and splitting the various parts of boots and shoes:"—A frame carries at one end a traversing slide actuated by a screw spindle. The slide "is fitted up with double wedged or inclined surfaces for the purpose of setting it up" to a revolving cutter. The leather is laid on a table over the slide and held by a clip or pins, or by atmospheric pressure, the table having a perforated or porous surface. A partial vacuum is produced below the surface of the table; the apparatus which the inventor prefers to use is described in the Specification. The table can be readily changed for another having another surface, so that "various shapes or thicknesses" of leather may be obtained.

Some machines are arranged "on the endless band principle," the novelty claimed being that the band works horizontally.

3. "Bevelling or shaping the inner and outer edges of soles" previous to their being attached:—On a table are fixed a bracket carrying a "moveable screw centre" and a "hollow boss" which forms a bearing for a spindle. On the spindle are keyed a cutter, a roller beneath the cutter, and (under the table) a grooved pulley in connection with "any prime mover." The table carries also a piece whereon a slide moves. The slide carries (1) a stud whereon a worm wheel turns; (2) bearings for a worm shaft; (3) a bracket through which passes a screw tightener attached to a presser. The worm wheel is secured to a templet "which is on the same outline as the sole." The sole is held between the templet and the presser, and motion is imparted to it by turning the handle of the worm shaft. A weighted cord connected to the slide keeps the templet "in continual contact with the loose roller" and "makes allowance for the irregular outline" of the templet. The inventor does not confine himself to these "special arrangements."

4. "Paring or bevelling certain parts of boots and shoes, such as linings or stiffeners:—A rod connected to a treadle is attached at its upper end to a presser plate; this plate when brought down on the surface of a table presses upon the leather which is laid on a moveable templet. The templet is placed on a wooden block which lies on a piece of caoutchouc, the caoutchouc acting "as a spring for allowing for the differences in the thickness of the material." The knife works upon a metal guide. A spring raises the presser when the treadle is released.

5. "Hollowing out or shaping the side nearest the tread of the heel:—The machine used for this purpose consists principally of (1) a bed plate; (2) a revolving cutter fixed on a shaft which carries "a speedy pulley"; (3) a lever capable of vertical and lateral motion and centred on a stud which "is free to revolve in its bearing"; (4) a "carriage or holder with its adjuncts" attached to the lever; (5) a "heel holder or clump"; (6) a lever pivoted on a pin and carrying a tightening screw; (7) a catch for retaining the last-named lever in position; (7) a stop "for regulating the vertical travel"

the first-mentioned lever. "The same result can be obtained by employing a revolving cutter of a much smaller size in combination with a templet on the principle of a carving machine."

The working of the machines is explained in the Specification.

[Printed, 1s. Drawing.]

A.D. 1858, December 31.—No. 2999.

JOHNSON, JOHN HENRY. — (*A communication.*) — "Improvements in the manufacture or production of boots and shoes or other coverings for the feet, and in the machinery and apparatus employed in such manufacture."

1. An improved last :—The last is of metal, and its shank is hollow. Holes, "corresponding with the holes to be pierced in the parts to be united," are made in the bottom of the last. When the boot or shoe sole is pierced, the piercers pass through the sole into the holes; when the piercers are withdrawn, "a metal sole, which is placed upon the last and forms part of it, is slightly drawn towards one end of the last so as to cover the holes" and prevent the pegs from entering the holes of the last. For riveting "elastic fastenings," two metal soles (both perforated) are used; motion is imparted to both, "but generally to the one next the last," by a lever jointed to them and passing through the shank.

2. "Countersinking or differential piercing" of soles :—The sole is placed on a block fitted with guide pins and "properly shaped." A corresponding presser block works vertically on guides carrying coiled springs. On the under surface of the presser block are arranged piercers having shoulders or enlarged parts to effect the countersinking. The lower block is perforated for the entrance of the piercers; the upper one carries "a spring ejector" (to clear the sole from it after the piercing pressure) and a cushion of caoutchouc to insure "working elasticity." The method of fastening on the sole whether of leather or gutta percha is described.

3. A pegging machine for uniting the soles and heels to the other parts :—The last carrying an upper and an insole is placed upon "the table or traveller of an hydrostatic press." An outer sole "with a portion of the heel annexed to it" is laid on, and the last is pressed against a perforated plate or die

of the shape and size of the boot or shoe. Over this plate is another plate or frame "containing a series of piercers which take into the holes of the perforated plate." Guide pins make all the parts to correspond. Each piercer is forced into the sole by a hammer "which is guided in its travel indirectly by means of a cam." The cam acts upon a lever connected to a traveller slide, "which carries the hammer upon it and at the same time imparts motion to a perforated frame carrying the fastenings, such fastenings being made or dropped into it as the traveller moves." The revolution of this part of the machine being completed, "the piercer carrier is forced from the shoe by means of a lever or other convenient means and removed." The metal sole on the last being moved so as to close the holes, the frame with the fastening is drawn over the perforated frame, "and over this again a frame containing a corresponding number of small hammers or drivers." The cam actuating the travelling hammer is put into motion, and the striking operation is repeated; this "has the effect of driving each fastening separately and in succession its proper distance through and into the bottom of the boot or shoe."

Modifications of certain parts and the details of each machine are given in the Specification.

[Printed, 1s. 6d. Drawings.]

1859.

A.D. 1859, January 10.—No. 74.

CLAXTON, THOMAS JAMES. — (*A communication from Mellen Bray.*)—"Improvements in the manufacture of boots and shoes." The improvement consists in applying to the toes of boots and shoes a guard or cap of metal (by preference of sheet copper) or of gutta percha or india-rubber or a compound of the two.

If the guard is of metal, the upper portion overlaps a part of the boot or shoe, and the lower portion passes between the upper and the sole; the lower portion has holes drilled through it and is fixed on by pegs, rivets, or equivalents. If the guard

is of gutta percha or india-rubber, it is fastened on by heat or cement.

To blacken the guard a composition is used consisting of two parts of copal varnish, one part of japan, and as much lampblack as can be added without rendering the composition too thick.

[Printed, 6d. Drawing.]

A.D. 1859, January 19.—No. 167.

JOHNSON, JOHN HENRY.—(*A communication from Jules Mathieu.*)—"Improvements in the manufacture or production of lasts, boot trees, and clogs, and in the machinery and apparatus employed in the production of such articles."

1. Machinery "for producing duplicates, either enlarged or otherwise, of the last or clog":—The framing or standard carries "a longitudinal bed," on the upper portion of which is formed a slide. A headstock supports a revolving spindle "projecting on either side, the one for carrying the model last or clog, and the other the material to be wrought into shape." The outer ends of the model and material are supported by sliding poppet heads, which as well as the headstock "are free to vibrate on a fixed centre" and are acted upon by a counterbalance weight. The poppet heads "and their adjuncts" also slide "in the direction of the length of the machine" by means of a screw. A bracket "fixed on a compound slide" carries a roller (the form of which is shewn in the drawing); a screw, moving the bracket "in a direction parallel to the axis of the machine," is actuated by a series of change wheels." On the first-mentioned screw a spur wheel "running loose" gears with the driving pinion; on the end of the screw is keyed a pinion in gear with the change wheels; and a clutch "sliding in feathers fixed in the screw" gears with the spur wheel. A revolving cutter carried by a frame and "of corresponding formation to the roller," is placed opposite to the material. "In lieu of change wheels a lever having an adjustable fulcrum may be used acted upon by the travel of the poppet heads." The working of the machinery is described.

2. A chuck "for the purpose of dispensing with centres for holding the material" consists of gripping pieces "which are propelled towards the centre" by screws.

3. A machine "for preparing the contact surfaces of the various parts of boot trees and lasts":—A table has on its upper surface a slide "formed along its entire length." A bracket fixed on the top of the table is provided with a boss bored to serve as a bearing for a spindle. The spindle carries at one end a pulley connected to any suitable driver and at the other a circular cutter. A slide, "working at right angles" to the other and provided with a right and left handed screw, is "attached to sliding jaws" which contain between them blocks suitably formed to grip the pieces to be operated on. The cutter "faces or cleans the surface and produces either a groove or a projecting feather" according to the shape of the cutter used.

4. In boot trees stops are used, "whereby the adjustment of the respective parts in relation to each other is more readily accomplished when putting them together." Separate metal strips or tongues may be substituted for the tongue formed out of the material.

[Printed, 10d. Drawing.]

A.D. 1859, January 19.—No. 169.

CLARK, WILLIAM.—(*A communication from Charles Jules Pierre Desnos.*)—(*Provisional protection only.*)—"Improve-ments in boots & shoes, and in the machinery, apparatus, and means employed in such manufacture."

1. While the sole and heel are being fastened on, motion is imparted to the frame containing the last and upper and to the parts connected therewith by means of "a screw, change wheels, and templates." A template somewhat similar in outline to the sole guides the last, &c. by means of a shaft or lever, motion being given to the shaft by a screw and cam or either. Provision is made "for changing the centre of action, cam, or wheels so as to obtain various sizes from one model."

2. The heel and part of the sole are fastened on "from the inside;" piercers or drivers and guides for the same in which they are free to move perforate and insert the fastenings by pressure or concussion; guides or cells for the fastenings are used.

3. The soles are perforated and countersunk by suitable punches inserted into plates or dies.

4. The nails or rivets used are "of a round taper form or "with chisel points;" they have "thick heads," are "comp-
"pressed in suitable parts of greater or less circumference,"
and when they are to be applied to gutta percha soles, they
are made with a flange in the middle or other part.

5. The lasting or mounting is performed by "a sliding or
"separate action or motion being imparted to a support and
"presser for forcing the upper" upon the last; the presser is
covered with india-rubber.

[Printed, 4d. No Drawings.]

A.D. 1859, January 21.—No. 185.

LE PRINCE, Louis.—"The improvement of ladies' boots
"and shoes called the Caméleon boot and the Caméleon
"shoe." The upper is made with "ornamental perforations
"or pierced work." A sheath is formed between the per-
forated portion and the lining for the introduction of a remov-
able piece of material of any colour or covered with silk, &c.
of any colour. The perforations may be either plain openings
or ornamented or partly filled with lace or openwork.

In shoes the opening of the sheath may be concealed by
placing over it "a bow or rosette which is attached by two
"elastic loops to two buttons," or by making the lining
"somewhat shorter than the upper."

In boots the mouth of the sheath is usually within the boot;
it may be on the outside and concealed by a bow as in the shoe.
In Balmoral boots there is "some additional perforated orna-
"ment on one or both sides of the lacing;" the sheath
required may open at the upper edge of the boot or laterally
within by the side of the eyelet holes.

[Printed, 10d. Drawings.]

A.D. 1859, February 28.—No. 532.

TURNER, ARCHIBALD.—(*Provisional protection only.*)—
"Improvements in the manufacture of elastic fabrics." The
chief object of the inventor is to produce an elastic fabric
"with a surface resembling that of woollen cloth." For this
purpose the warp threads (and if preferred the weft threads
also) are made "by doubling or twisting together a fine yarn
"of cotton, silk, flax, worsted, or other suitable fibrous ma-

“terial with another yarn of fine wool,” so that the woollen “yarn forms “the principal part of the surface.” Elastic fabrics may be made with these compound threads in combination with strands of india-rubber.

These fabrics are intended especially “for the fronts of “ladies’ and gentlemen’s boots.” Pieces of the required shape are cut from the fabric and bound round such of the edges as require protection.

[Printed, 4d. No Drawings.]

A.D. 1859, March 12.—No. 633.

NEWTON, WILLIAM EDWARD. — (*A communication from Christopher Meyer.*)—(*Provisional protection only.*)—“Improvements in the manufacture of shoes and other coverings “for the feet.” These shoes “can be worn either without “another shoe or as an overshoe.” The uppers are of cloth, felt, or other fabric that is pervious to air; the sole, foxing, and binding are of india-rubber.

The upper, being “prepared by the agency of heat and “pressure on those parts only which are to receive the “foxing and binding,” is attached to the sole with a coating of india rubber “that contains the vulcanized ingredient or “ingredients;” the foxing and binding are then applied, and the whole are united “by vulcanization.”

[Printed, 4d. No Drawings.]

A.D. 1859, March 14.—No. 640.

WALLER, RICHARD. — “Improvements in joining leather, “flexible and textile materials for the production of boots “and shoes, and articles of the like description, and harness, “strapping, bags, sails, tent-covers, portmanteaus, and such “other articles, together with machinery and apparatus “for that purpose.” The machinery consists mainly, of (1) blades for cutting out soles; (2) steam-tight troughs for moistening the soles; (3) a press, rollers, or beaters; (4) a pressing or sole plate; (5) awls and plungers; (6) a clamp block and box; (7) slides; (8) a sliding frame; (9) a frame moving at about right angles to the slides and sliding frame; (10) bobbins round which wires are wound; (11) a box fitted with rollers so as to draw down a certain length of

wire, the length being regulated by a ratchet and passed through tubular guides to a rivet guide; (12) a band-saw capable of moving with the frame and cutting off a given length of wires at a point between the tubular guides and the rivet guide; (13) an arm sustaining the rivet guide and swivelling by a joint so as to carry the rivets to the sole plate; (14) a presser block; all are suitably arranged with their necessary appendages.

The clamp block (which is formed in two or more pieces) is composed of (1) a place for the last; (2) welting sides perforated or serrated to leave space for the rivets; (3) levers which force the welting sides to lap the upper leather and are actuated by shafts and mitre wheels; and (4) handles to lift the clamp block out of the box.

The articles are finished off by spiral cutters and burnishers which have hot air, water, or steam conveyed into their spindles.

A number of boots and shoes can be made at one time.

Very full details of the arrangement of the foregoing parts and of the method of manufacture are given in the specification, and the patentee does not confine himself to the details given, as "many variations may be made without departing from the principle" of the invention.

[Printed, 1s. Drawing.]

A.D. 1859, March 28.—No. 776.

TURNER, ARCHIBALD.—(*Provisional protection only.*)—"Improvements in the manufacture of elastic fabrics." The inventor makes an elastic fabric "with a surface resembling that of woollen cloth," and intends it "to be employed more particularly for the fronts of ladies' and gentlemen's boots."

The warp threads (and sometimes the weft threads also) are made by doubling or twisting together a fine yarn of cotton, silk, flax, worsted, or other suitable fibrous material with a yarn of fine wool in such manner that "the woollen yarn will form the principal part of the surface." Other methods of making the compound threads are described. Elastic fabrics are manufactured with these compound threads "in combination with strands of india rubber."

To make the fronts, pieces of the required shape are cut from the fabric, and such edges as need protection are bound with ribbon or tape.

[Printed, 4d. No Drawings.]

A.D. 1859, March 29.—No. 789.

MOSS, HENRY, and WEST, THOMAS.—“A machine for the cutting of leather for every purpose, and cutting cloth, linen, and other fabrics and materials.” This machine may be made with or without a “self-acting feed.” The stamp or knife is provided with a spring “for clearing itself of the material;” it will cut “some six or seven shapes before it requires emptying;” it cuts “a square edge,” and is made “larger at the top than at the bottom.”

The cams required are fixed on an “eccentric shaft,” by which “the self-acting feed is obtained.” A table (on which the material is placed) moves on rollers over a bed, being propelled by a rack and wheel. The stamp or knife is fitted or fixed to a crosshead which is carried by rods or arms on the shaft. Other parts of the machine are (1) a “shaft upon which the regulating motion is attached;” (2) a wheel connected with a lever “for regulating the distance;” (3) slides “for giving parallel motion” to the crosshead; (4) nuts “to raise or lower the crosshead;” (5) friction rollers “for conducting the table in its traversing position;” (6) guides and “a spring to act as guide to any material that is traversing” to the stamp or knife. The driving shaft is moved by either a winch handle or any other convenient means.

[Printed, 10d. Drawing.]

A.D. 1859, March 30.—No. 790.

BROWN, WALTER.—“Improvements in manufacturing clog soles and in the machinery employed therein.” The soles are shaped by means of “cutters of various shapes, to which either rotary or reciprocating motion is given by steam or other power.” The blocks from which the soles are made are fixed to a traversing slide or table; or they may be fixed to a stationary table, and the traversing motion may be given to the cutters. As the upper surfaces of the soles

must be hollowed out to fit the foot the cutters are "supported " in a swing frame, to give the requisite curve." The groove round the edge of the sole, into which the upper leather is secured, is made by cutters also. The clamps to hold the blocks on the slide or table have a serrated edge; one is secured to the table "by bolts passing thro' slots," the other is acted upon by an "excentric shaft" supported in bearings fixed to the table; both however may be moveable.

The required motion is communicated to the various parts of the machine by means of pulleys, bands, shafts, and gearing, all of which are fully explained in the specification. The slide or table is moved to and fro on flanges projecting from the side frames by a screw. The cutters are attached by set screws to a "spiral cutter block" which revolves in a swing frame supported by standards, the block being made spiral "to obtain a diagonal cutting edge, which is most " desirable in cutting wood."

At starting the table is "at the left-hand side of the " machine;" the cutters "for shaping the lower part" of the soles are screwed to the block; the table is moved slowly on, and the cutters are turned round rapidly. When the table has traversed to the other end of the machine, its motion is stopped, the blocks are liberated and placed "on edge on the table," the proper cutters are attached to the block, and "both the edges are cut."

To cut the upper surface of the soles to the proper shape and hollow them out, the soles are again fixed to the table; suitably shaped cutters are screwed to the block, and the soles are brought "under the centre of the swinging frame," which is caused to vibrate by a crank; "the radius of the " hollow can be varied" by means of screws and bevel wheels. As soon as one sole has been operated upon, the table is moved by a rack under it and a wheel the required distance to bring another sole under the centre of the frame, "which " in vibrating back operates in like manner on the sole under " it."

To round the heels and cut the grooves, other cutters are employed; they are fixed to blocks keyed on upright shafts in gear with part of the gearing of the machine; they "revolve " in opposite directions, the one being driven from the other" by friction pulleys. The soles are held between set screws

passing through a swinging frame. The workman "presents one side of the heel to the action of one of the cutters," then turns the sole "about one-fourth round to bevel one-half " of the heel and cut a part of the groove," and then "by " moving the swing frame" brings the other side of the heel into position for the other cutter. The soles are completed by finishing the groove by aid of one of the cutters.

Instead of changing the cutters for each operation, separate machines may be employed.

[Printed, 10d. Drawing.]

A.D. 1859, April 7.—No. 872.

RAWLINGS, JAMES.—(*Provisional protection only.*)—"An " improved construction of boot tree," whereby the cleaner can " operate simultaneously with both hands on a boot or " shoe."

This boot tree can be fastened to any point, as a wall or post ; " it consists simply of a fixed bracket piece (the extremity of " which forms an abutment for the heel of the boot), and a " rock lever hinged to and in front of the fixed piece." One end of the lever carries a handle, the other is shaped "to fit " the toe of the boot or shoe." By moving the handle outwards "the foot of the tree will be contracted and allow of " the boot or shoe being readily slipped on," but when moved in the opposite direction "the toe piece is thrust out, and the " boot or shoe tightly gripped by the tree." The grip is maintained "by a rack and click arrangement or its equivalent."

"To provide for the upper part of the boot being held at " tension," an additional bar may be attached at its lower extremity to the back of the bracket piece, and its upper end may be made "to bear against the end of the rack."

[Printed, 4d. No Drawings.]

A.D. 1859, April 9.—No. 896.

GARDNER, HENRY FRANCIS.—(*Partly a communication from William Willmott and Philander Shaw.*)—"Improvements in " machinery for blocking or crimping the uppers of boots and " shoes, and in treeing boots." The upper leather is laid over the edges of a pair of adjustable face plates, "shaped so that " their upper edges take a form somewhat like the inverted

"figure of the shaped edge of an ordinary block." The plates are parallel to each other, and at such distance apart that they will admit of a flat lever working up and down between them, "while the upper leather is tightly strained over "the lever." The lever is hinged to the bed plate or framing of the machine and is worked by a handle; "its under edge "corresponds in form to the shape to which the leather is "required to be blocked." Affixed to the lever is "a standard, "which forms a guide for a sliding block," carrying at its opposite sides a pair of clips or jaws; the block (with the jaws) is raised by "a cam-shaped lever or its equivalent," and is retained in position when required by "a ratchet wheel and "tumbling click." The jaws grip the lateral projections of the leather, strain the lever tightly over the blocking lever, and hold it while the lever is worked up and down. The arrangement and "the operation of the several parts" are explained in the Specification.

When the leather has been blocked, it is removed and secured on a wooden block until it is dry. This block has adapted to it the following "contrivance," whereby the leather may be tightly held by the corners, and be kept strained to the same extent as in the blocking machine:—A screw, passing freely "through a metal bridge piece," has "a plain end" which enters a hole in the block. The screw "passes through a "female screw cut in a wedge-shaped block," which is placed "between the sides of the bridge piece," and "rises on the "screw as the latter is turned round." The corners of the leather are held "between the sides of the wedge-shaped "block" and "the inner sides of the bridge piece."

The leg of the boot-tree is composed of two parts, connected by two or more pairs of toggle levers; these are jointed to tapped bosses, which work respectively on right and left hand screws "cut on a central screw shaft." A removable foot piece is held in place by a button "formed on the extremity of "and operated by a rod," which passes down through the tree. The tree is expanded by turning the central shaft. To permit of the lower part being expanded without expanding the upper part, a bar jointed to one part near the upper end passes through a socket on the other part and is held by a binding screw.

[Printed, 1s. Drawings.]

A.D. 1859, April 12.—No. 919.

CROSSDALE, JAMES.—“Improvements in boots and shoes,” rendering them self-ventilating by introducing elastic tubing between the insole and the outer sole.

The lower surface of the insole is grooved all round in depth to about half the diameter of the tubing, and holes are punched in it “for connecting the tubing to the insole by eyelets.” The open ends of the tubing “are then sewn over, and closed and “afterwards pulled up” above holes made in the upper (sufficiently high to prevent the entrance of wet or dirt); eyelets are then inserted through the holes and the tubing. The lining is cut so that the cut parts pass “over the tubing,” leaving the upright part of the tubing “between the lining “and the upper.” Cross pieces of tubing connect the tubing which passes round the sole and heel.

Sometimes the grooves are dispensed with, and oval or flat tubing is used. Sometimes the tubing is applied “at one “part only of the boot or shoe, say at the waist thereof, “acting as bellows;” in this case the patentee inserts “eyelets “into the holes in the other parts of the insole,” and packs “the unpunctured parts between the two soles with elastic “tubing or flat pieces of india-rubber or other suitable elastic “material.”

[Printed, 10d. Drawing.]

A.D. 1859, April 23.—No. 1019.

DICKS, WILLIAM and HOPWELL, WILLIAM.—“Improvements in machinery for making screws, and applying them “in fixing the soles of boots and shoes.” The machinery is put into motion by a treadle or by hand or other power. Wire or metal rod is fed into the machine through a tube, which receives rotatory motion from the driving shaft by the aid of “a suitable train of wheels.” Provision is made for changing the speed of the tube, and consequently the length of the screw produced. As the wire leaves the tube it passes between two grooved rollers at the front of the tube. One of the roller axles “is in a slot, and is capable of being set up “towards the other by a set screw.” The forward end of the wire is at all times between a pair of screw dies or cutters, so that as the wire rotates a screw will be cut thereon, and the screwed end will protrude more and more beyond the dies.

In order that the screw may enter the sole, the last, &c. is held up in position on a table. When the proper length of screw has entered the sole, it is cut off "by a suitable cutter, which cuts the screw flush with the outer surface of the sole."

Whilst the cut is being made, the motion of the tube and rollers is stopped, and the last, &c. is moved on the required distance "by means of a cam and interposed mechanism."

The cutter is a slide which is moved by a projection on the cam pressing down a lever.

[Printed, 10d. Drawing.]

A.D. 1859, April 25.—No. 1035.

HOLMES, JAMES.—"Improvements in applying eyelet holes to boots and shoes, and in binding boots and shoes." The eyelets are caused to serve at the same time for the passage of the laces and for attaching the binding at those parts where laces are used.

When the binding is of leather or other flexible substance, the eyelets are passed and fixed through both binding and upper leather. When the binding is of "a comparatively stiff character," as when "metal, stiff leather," or other such material is employed, it is "notched out" between the eyelets; and when it is not of metal, a disc is placed on each side of it, whereby it is held securely to that part of the upper which is between it. Or the binding material "is used in several pieces, one piece to each of the eyelet holes."

[Printed, 6d. Drawing.]

A.D. 1859, May 3.—No. 1111.

BLAKE, LYMAN REED.—"New and useful or improved machine for sewing a sole on a boot or shoe." This machine is "a chain-stitch" sewing machine. The hooked needle works through a rest or supporting surface of the upper part of "a long curved arm" which projects upwards from the table of the machine. This arm "should have such a form as to be capable of entering a shoe, so as to carry the rest into the toe part as well as any other part of the interior of it;" it carries at its front end, and "directly under the rest," a looper which is supported "within the end of the

"arm," so as to be capable of rotating or partially rotating round the needle, "while the said needle may extend into and through the eye of the looper, such eye being placed in the path of the needle."

The thread is led from a bobbin by suitable guides "along in the curved arm," thence "through a tension spring applied to the arm," and thence "upward through the notch of the looper."

The needle carrier extends upward with a cylindrical block which can be turned round concentrically with it by means of a handle.

The feed wheel, "by which the shoe is moved along the curved arm" during the process of sewing, is supported by a slider extending downward from the block "and applied thereto so as to be capable of sliding up and down therein."

The shoe is placed on the arm with the sole upward. The feed wheel is "made to rest on the sole."

In connection with the needle "what is termed a 'rest cast off' may be employed."

[Printed, 10d. Drawing.]

A.D. 1859, June 20.—No. 1486.

CLARKSON, THOMAS CHARLES.—(*Provisional protection only.*)—"Improvements in the manufacture of boots, shoes, and other articles." The inventor places a sock or cushion on the bottom of a last, draws a stocking fabric over them, and coats the fabric with a solution of india-rubber or other cement. He then sticks a strip of leather of suitable width at the edge of the bottom of the last, and sheet cork to the fabric, "taking care to have the cork wrap over the bottom edge of the last." In some cases he puts thereon, either with or without strips of cork, layers of curled hair about one inch apart, then a layer of cork coated with the solution on both sides, and then a covering of thin calico. He next sticks on "thin sheet cork, of nearly the shape required for what is termed by shoemakers the counter and side lining," of an extra thickness at the heel and round the edge near the bottom, and rasps off "the edge that stands up so as to make it thin at the top." Sometimes he places strips "of curled hair between the first foundation and the second or third lamina or layer," causing them to adhere by the

solution. He coats the whole with solution, covers it with thin calico (which is brought "over the under edge" of the last) and if required adds "a second thickness of cork." If a leather sole is required, it is fixed on with solution; the heel is affixed with either solution or screws. He turns and polishes the heel in a lathe after it is fastened on. He sometimes introduces strips of wood across or along the sole between the layers to give "rigidity or thickness."

[Printed, 4d. No Drawings.]

A.D. 1859, June 30.—No. 1564.

BERNARD, JULIAN.—"Improvements in uniting certain parts " of boots and shoes, and in the means employed therein." This invention relates to "improved forms of fastenings" for uniting soles to uppers and heels to soles. The fastenings are metal pegs, "having square-shouldered and regular shaped " finished heads" and presenting such an external appearance when driven into the sole or heel that the operation of rasping or smoothing is rendered unnecessary.

The fastenings may be varied in form to a great extent. Some are made "with one or more additional shoulders to " that formed by the head," so that when the outer head (which may be circular, square, six-sided, oval, &c.) is worn away, the next shoulder will continue to hold the material. Some heads are made with a groove across to imitate a screw; others with one or more ribs or projections thereon; others are bevelled.

The form of the shank may be varied; it may be tapered or conical, or with sides parallel to a certain point; the end may be pointed or chisel-shaped.

Twelve varieties are shown in the woodcuts and sheet of drawings.

[Printed, 8d. Woodcuts and Drawing.]

A.D. 1859, July 8.—No. 1625.

BOGGIS, GEORGE ALEXANDER. — (*Provisional protection only.*)—"Improvements in rendering boots and shoes water-" proof," without in any way "altering the appearance of " their exteriors." The inventor puts within the lower part of the boot or shoe a piece of thin waterproof material in the

form of a golosh, as high in or around the inside as may be required. A strip of thin material is sewn to the lining, and one edge of it "falls over the edge of the golosh and is secured " by the insole or sock lining."

[Printed, 4d. No Drawings.]

A.D. 1859, July 9.—No. 1636.

HENRY, MICHAEL.—(*A communication from Louis Alfred D'Hennin, Mathilde Catherine Georgette Ponceot, and Caliste Bloisbluche.*)—"Improvements in the manufacture of " overshoes and other articles worn on the feet, and in the " apparatus employed therein." These articles are made of gutta percha or similar substances or compounds by the aid of moulds and a pressing apparatus.

The mould consists of three pieces, namely, two outside pieces or halves with bevelled edges, and a core having a metal cheek or projection on each side and an aperture for the admission of the semifluid gutta percha and a piston.

In the pressing apparatus a portion of the frame presses against one of the outside pieces, "either directly or by the " intervention of a wedge," and a moveable plate is pressed up against the other piece. Adjustable arms are brought against the cheeks of the core "and press them against the " tops of the outside pieces." Another piece "presses the " fore part" of the core "against the corresponding parts" of the outside pieces, so that the pieces composing the mould "are all retained firmly and the mould closed." Motion is communicated to the plate, arms, &c. by hand wheels and screws.

When sufficient gutta is poured in, the piston is inserted; "it enters with a certain amount of friction," being driven in by a block which is actuated by one of the screws; it is raised up again by means of a hook and ring.

[Printed, 8d. Drawing.]

A.D. 1859, July 16.—No. 1682.

BERNARD, JULIAN.—"Improvements in the manufacture of " boots and shoes, and in the machinery and apparatus employed therein." The improvements consist (1) in "attaching heels to boots and shoes from the inside;" (2) in form-

ing countersunk holes in soles and heels "in course of manufacturing such parts, or previous to their being united to the boot or shoe, when such parts are made of plastic materials."

1. The heel and the boot or shoe "suitably adjusted in relation to each other" are placed over a sliding table. A perforated stem "which forms a guide for piercing" is shaped to fit the inside of the boot or shoe at the tread, and the parts are pressed between it and the table. This guide carries one or more piercers to be forced into the boot or shoe from the inside "by percussion or pressure either in detail or simultaneously." The piercers are withdrawn "by means of a lever and slide holder in which they are placed;" their "enlarged ends" prevent them from passing through the slide holder. Tacks or other fastenings are put into the holes of the guide; the slide with the piercers "is replaced by a similar one" which "contains hammers or drivers." Cams or templets are employed for "imparting motion to the piercers or drivers," and the bracket which carries the sliding table is raised and lowered by means of a treadle. The cams are so formed as "to throw the machine out of gear when each operation is performed," while the slide is "forced to move on so that the perforated guide need not be displaced until the operation is completed."

The patentee, after describing the details and working of the machinery, explains the arrangement required for making the apparatus "partially self-acting so as to be driven by any convenient prime mover."

2. Pegs of suitable shape are placed in the moulds used for the formation of these parts; they cause the sole or heel to be perforated with countersunk holes while the material is in a state to take and retain the given impressions.

[Printed, &c. Drawing.]

A.D. 1859, July 18.—No. 1691.

BERNARD, JULIAN.—"Improvements in the manufacture of boots and shoes, and in the means employed therein." This invention relates to the fastenings used for uniting the soles of boots and shoes to the uppers. The patentee employs for this purpose "flat or nearly flat headed" nails differing from common

tacks "inasmuch as the expanded head is shaped and finished
 " by suitable mechanism to any desired regular form, such as
 " round, square, oval, or polygonal." The nails are formed
 with tapering points or with chisel ends to enable them to be
 readily clinched if required, with "an additional shoulder or
 " shoulders upon the shank," and generally with concentric
 grooves or rings on the head. These nails do not require any
 " rasping or smoothing " after they are driven in.

[Printed, 6d. Drawing.]

A.D. 1859, July 21.—No. 1716.

SCOTT, EDWARD JOHN, and SCOTT, SAMUEL FREDERICK.—
 (*Provisional protection only.*)—"Improvements in the manu-
 " facture of boots and shoes." In order to save the time and
 labour occupied in filing down the exposed ends of sprigs and
 nails and in finishing off the surfaces of soles, the inventors
 finish the soles by stamping or other treatment before fixing
 them on, and fix them on "by means of pins formed with neat
 " and by preference solid heads which require no filing,
 " finishing, or other treatment after being hammered home."

[Printed, 4d. No Drawings.]

A.D. 1859, August 6.—No. 1813.

STOCKER, ALEXANDER SOUTHWOOD, and FARMER, GEORGE
 JAMES.—(*Provisional protection only.*)—"Improvements
 appertaining to articles to be affixed to boots and shoes and to
 " the feet of animals, and in machinery and means to be
 " employed for producing the same." This invention relates to
 improvements on the one for which letters patent were granted
 to A. S. Stocker and T. Johnson on July 20th, 1839, No. 8162
 " for manufacturing shoe heels and toe tips." The improve-
 ments consist "in adding to the rack and pinion motion
 " therein set forth self-acting cutting-off, feeding, and delivery
 " motions," so that the articles produced shall be made from
 the long rods of iron "as they leave the rolling mill" instead
 of "previously cutting them into short lengths." The feeding
 apparatus may be composed of "rollers, cranks, ratchets, or
 " other means which are in common use," and the cutting off
 of each article may be accomplished "by a stationary and a
 " moveable cutter." Each article is delivered from the ma-
 chine "by the aid of a self-acting lever."

Moreover the inventors cause "the motion of machines for bending the articles herein set forth to work, revolve, or move in adjustable centres instead of journals;" they also introduce "a self-acting motion or grip" to hold the rod while being bent.

[Printed, 4*l*. No Drawings.]

A.D. 1859, August 15.—No. 1880.

JEYES, JOHN.—(*Provisional protection only*).—"An improvement in the manufacture of boots and shoes." The improvement consists in the employment of what the inventor calls "a marginal welt," namely, a welt "formed of a strip in such manner that it may be turned over in order to permit of its being first sewn to the upper leather and afterwards to the sole." Before the welt is sewn to the upper and sole, the parts are caused to adhere by paste or other adhesive substance.

[Printed, 4*l*. No Drawings.]

A.D. 1859, August 24.—No. 1931.

PEARSON, GEORGE.—"Improved machinery for manufacturing boots and shoes." This machine (1) cuts and deposits the pegs in the feeding apparatus; (2) pierces holes in the sole; (3) conveys the pegs into the holes; (4) drives the pegs in and clinches them.

The principal parts of the machine are (1) a table supporting the last (bottom upwards); (2) a vertical slide furnished with a pricker and a punch or hammer; (3) a horizontal slide "through which there is a slot just of sufficient size to admit one peg at once;" (4) a case for the horizontal slide having at its inner end "a projecting piece which rests on the shoe;" (5) a slide for raising and depressing the case and rest "into which it is firmly screwed," and having fitted into it "an adjustable tube for the pegs to pass down into the slot in the slide;" (6) a rack (driven by a pinion) "supporting and moving the last;" (7) "cams and their respective levers calculated and arranged to perform their respective duties in the order of time;" (8) framing, driving shaft, fly wheel, &c.

The cutting and depositing the pegs in the feeding apparatus are accomplished "by arrangements feeding the wire into the

“ vertical slide and by means of a diamond cutter attached to
“ the machine near to the point of connection of the vertical
“ with the horizontal slide and operated by a lever from the
“ driving shaft ; ” the required length is cut off and is then
“ conveyed by the slide and deposited in its place in the
“ shoe.”

[Printed, 10*d.* Drawing.]

A.D. 1859, August 31.—No. 1983.

MIDDLETON, SAMUEL. — “ Improvements in the mode or
“ method of uniting and otherwise manufacturing articles of
“ leather and such like materials, and in the apparatus and
“ machinery connected therewith.” The patentee unites the
soles and heels of boots and shoes to the uppers and insoles,
and parts of other articles made of leather by means of “ metal
“ fastenings of a novel shape.”

These fastenings are pegs “ somewhat similar in shape to
“ the eye of a needle which has been pointed at one or both
“ ends and barbed upon one or both of the flattened faces at
“ the point or points of each of such peg.” Sometimes the
pegs are formed with “ one taper sharp end,” whilst the other
end “ is flat or cut square behind the eye or slot.”

These pegs are made of wire cut into lengths, stamped into
shape, formed with an eye, tapered, and barbed, at one or
several operations ; or they may be cut, &c. from sheets of
metal. Instead of being punched with a single eye, there
may be “ holes of various shapes or indentations over one or
“ more of the surfaces.”

The materials to be united are softened by immersion in
water and afterwards partially dried ; when the pegs are driven
in, the materials expand through the eyes. For further secu-
rity the surfaces to be united are coated with a solution of
shell-lac and gutta percha or india-rubber.

If the boots and shoes are made by hand, the pegs are in-
serted “ by means of hollow punches made to receive one end
“ of each peg up to the shoulder or projection thereof ; ” if
mechanism is employed, the pegs are fed into a perforated
holder and are inserted by means of “ an eccentric, cam, crank,
“ or other equivalent means.”

[Printed, 8*d.* Drawing.]

A.D. 1859, September 2.—No. 1999.

BERNARD, JULIAN.—“Improvements in the manufacture or “production of boots and shoes, in the machinery, apparatus, “and means employed in such manufacture.” The first part of this invention relates to a machine “for cutting the various “parts” of boots and shoes; it is applicable also “for pressing, blocking, ornamenting, or piercing” such parts as may be required. “The main or principal feature” of the machine consists of “a moveable carrier and a combination of tools;” any convenient number of tools can be arranged and fixed thereon “without rendering it necessary to remove or otherwise disconnect the carrier.” The arrangement is such that any required tool can be brought “immediately in its proper “position in reference to the pressing or resisting part of the “machine, such for example as the cutting or pressing table,” and be fixed in any one position during the action of the machine. Sometimes “compound carriers” are used, an arrangement “more especially adapted for piercing or blocking “and when compound tools are employed.” The pressure is obtained by means of a “hydrostatic press.”

The second part is a machine “for paring, polishing, or “reducing the edges of soles or heels” by means of revolving cutters. The part to be operated on is actuated so as to pass round the cutter, “motion being imparted by suitable levers “and cams in conjunction with a compound slide.” The outline is regulated by a template in combination with springs, weights, or “suitable grooves to regulate the travel.” The springs and a “free slide” to which they are secured at one end “form the principal feature” of this part of the invention.

The third part consists of a machine “for holding during “the operation of splitting, dividing, or shaping boot or shoe “materials.” The peculiarity of this machine is that it “divides equally or at any desired angle or proportion” the material to be cut. The material is placed between two surfaces regulated by a right and left hand screw or inclines. A band knife passes between the surfaces, which are “inclined “or so formed as to retain the material at any desired angle “or placed in a frame common to both sides of the holder.” The frame “is placed upon centres in a line with the cutting “action,” so that the material can be cut at any desired angle

“ by moving the frame upon its centre ;” it (or the holder) stands on “ a table with a sliding action so as to admit of “ the material being moved against the cutting instrument.”

Each machine (and modifications of certain parts) is described at length in the Specification.

[Printed, 1s. Drawing.]

A.D. 1859, September 27.—No. 2183.

BIRTWELL, THOMAS, and MARSHALL, RICHARD.—(*Provisional protection only.*)—“ An improved arrangement of “ apparatus to facilitate the putting on of boots to the feet.” The apparatus is composed of a foot-piece and vertical supports. The foot-piece (of wood or metal) has one end “ recessed to contain the boot heel.” The supports have “ their upper extremities increased in width.” The boot loops are placed upon the supports, “ and thus the boot is “ supported and firmly held.” The supports may be made to fold or take out “ in order to effect portability.”

[Printed, 4d. No Drawings.]

A.D. 1859, October 1.—No. 2228.

STOCKER, ALEXANDER SOUTHWOOD. — “ Improvements in “ the manufacture of articles to be affixed to boots and shoes, “ and to the feet of animals, also applicable to chain links, “ washers, and other suitable articles, and in the dies to be “ used therein.” This invention, as regards the present series, consists in a more accurate method of making heel-tips and toe-pieces ; the process is described in the manufacture of “ a “ Scotch shoe heel.”

A rolled bar of iron is cut into suitable lengths and is bent into shape by any well known means ; after this it is placed in or upon the matrix of a die and subjected to pressure.

The die is by preference made of malleable iron and used “ in its unannealed state ;” the matrix should be so formed “ as to fit a true section of the iron in its bar state as it leaves “ the rolling mill,” except that the part corresponding to the back of the heel “ is sunk deeper than at any other part.” This increased depth “ is made to die-off gradually and run “ into the natural rolled shape, depth, and gauge of the “ original bar.” Or the matrix may be made rather wider at

this part, the object being to enable the increased thickness of metal in that portion of the blank to be received into and be properly shaped by the die when the pressure is applied. "This deepening or widening of the matrix at one particular part constitutes an essential feature" of the invention. On the bottom of the matrix are projections which form counter-sunk recesses for the reception of nail heads. The sides of the matrix "are bevelled inwards," the outer side "being" rather more bevelled than the inner one."

The process of manufacture admits of modifications which are described in the Specification.

[Printed, 8d. Drawing.]

A.D. 1859, October 4.—No. 2249.

RAWLINGS, JAMES.—"An improved construction of boot "tree." This tree can be instantly contracted or expanded; it can be attached "to any convenient fixed point," thereby enabling the cleaner "to operate simultaneously with both hands on a boot or shoe."

The tree is composed of "a fixed bracket piece" and "a rock lever," both of cast iron, and of a shield "made of sheet iron, and curved somewhat like the front of the leg of a boot." The lower extremity of the bracket piece enters the boot or shoe and forms "an abutment for the heel." The lever is hinged to a lug cast on the front of the bracket piece; its top carries a handle; its lower end is shaped to fit the toe of the boot or shoe. Projecting from the back of the lever is a segment rack having its teeth on its upper edge; it moves through a slot formed in the bracket piece and is retained in position by a click pinned to the bracket piece.

The shield is required only for Wellington, Hessian, and like boots; at its lower end is a tang which takes into a slot in the foot of the lever; at its upper end is a rack which, when the shield is used, passes through a slot in the lever, through a slot in the bracket piece, and is held by a click hinged to the lever.

For the use of bootmakers, the lever is made without a foot piece, and is shaped "to allow the attachment thereto of loose lasts."

Sometimes the foot is jointed to the lever "by a kind of knuckle joint."

[Printed, 10d. Drawing.]

A.D. 1859, October 12.—No. 2327.

SOUTHALL, CHARLES HENRY.—"An improved apparatus "for making and finishing boots and shoes." This apparatus is applicable for fixing soles and heels to uppers by means of screwed pins; "various self-acting movements" put a screw-thread on the wire, screw the wire into the sole, cut off the superfluous wire, move the boot or shoe the distance required, and give continuous rotary motions to cutters and to "glazing "wheels" (or circular polished surfaces) and a brush.

"By means of a wheel with teeth upon a portion of its "periphery," a revolving motion is given at certain intervals to the wire for forming the pins. The threads on the pins are made "by a screw plate or dies," the entrance of the pins into the sole "going on at the same time." During the stoppage of the revolving motion of the wire, the pins are cut off "by "shears or cutters put in motion by a cam driven in any suitable manner." The boot or shoe is moved "by dividing "wheels, according to the required distance between the "screwed pins." After the sole has been screwed on, the boot or shoe is removed to another part of the apparatus, "the table of which is moved so as to press the edge of the "sole against a circular cutter put in motion by wheels and "pulleys in the usual manner," the correct action of the cutter being maintained by a guard. After the sole is cut, it is pressed against the polished surfaces and the brush, "so as to "give it any desired amount of finish." An "intermediate "shaft," driven by the main shaft, carries the "wheels, cams, "or tappets, which give motion to the required operations."

The specification contains a full description of the arrangements &c. of the various parts of the apparatus and a modification of some parts.

[Printed, 10d. Drawing.]

A.D. 1859, October 17.—No. 2369.

BERNARD, JULIAN.—"Improvements in the manufacture or "production of boots and shoes and other coverings for the "feet, and in the machinery, apparatus, and means connected "with such manufacture." This invention "consists of a "peculiarly formed last," by means of which the operation of *lasting or mounting* can be more readily effected.

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The last is made in two or more pieces, "the line of division" "extending from the back part of the heel to or near the" "under side of the toe." The contact surfaces are slightly curved, thereby greatly assisting "the disengaging of the boot" "or shoe" when required. The upper part is provided with a projection which fits into a groove in the lower part, and keeps the two parts "always in the same relation laterally to" "each other." The last is mounted (sole upwards) on a table; it is "provided with a joint or centre," which "allows the" "whole apparatus to be raised or turned over"; a rack retains the apparatus at any desired elevation. A lever works on a joint attached to the under side of the table; it is kept in any desired position by a rack; a cord or chain, fastened to it and to the upper part of the last, causes the upper part "to travel" "in a longitudinal direction according as the lever is moved" "upwards or downwards." On each side of the last "horizontal spindles" fitted with handles revolve in bearings; attached to them are springs or fingers which "press round" "the edge of the last for the purpose of firmly retaining the" "upper" in place. Toothed arcs serve as detents to keep the springs in contact with the last.

The "tightening or bracing action" may be effected by aid of "a conically pointed pin," which passes through the upper portion of the last into a suitable recess formed in the lower portion, thereby dispensing with "the retaining lever and" "other parts previously alluded to."

[Printed, *8d.* Drawing.]

A.D. 1859, October 19.—No. 2399.

PALMER, JOSEPH RANDALL.—"Improvements in the manufacture of printing ink and paints and varnishes, and also in" "the manufacture of lacquers, japans, and blacking." The base of these articles is "the residual black powder obtained" "when manufacturing lilac or purple colours from salts of" "aniline and such like substances" (as described in the letters patent granted to W. H. Perkins, dated August 26th, 1856, No. 1984), "in place of or in combination with lamp or ivory" "black." When this black precipitate (called by the patentee black chromium) is to be mixed with lamp or ivory black, the proportions are about 25 per cent. of the former and 75 per cent. of the latter.

The patentee obtains "a very fine powder" preferably by the use of two machines which he terms a "pulveriser," and a "dressing or sifting machine." In the former "two very large and finely turned iron balls" revolve round the bottom and part of the sides of a vessel, whose inside is "as concave as the iron balls are convex." Two agitators "precede the course of the revolving balls."

In the latter "four drum-shaped sieves," made of fine copper-wire gauze and fitted with tight drum heads of leather, "make a partial rotation on their axes, first in one direction and then in the other." Under each sieve is a receiver made of leather and fitted on tightly to prevent loss.

Any particles which will not pass through the meshes of the sieves are taken out and again put into the pulveriser.

[Printed, 4d. No Drawings.]

A.D. 1859, October 25.—No. 2441.

TEBBUTT, EDWARD SQUIRE.—"An improved manufacture of elastic fabrics," suitable for "gussets, boot fronts, or other parts of boots or shoes." The surfaces of this compound fabric are "of an even or cloth-like character and free from corrugations or puckers."

The patentee finds that the best result is obtained "when the number of india-rubber threads used per inch corresponds to or is about the same as the number or gauge of the thread itself." He proposes to use "No. 40 india-rubber thread"; forty of these per inch are put (by preference in a dry and distended state) between two pieces of fabric which have been previously coated with india-rubber cement. The whole is subjected to pressure until the cement is dry enough to cause the parts to adhere firmly, when the compound fabric is "allowed to contract."

Sometimes the threads are coated with cement immediately before they are allowed to come into contact with the cemented surfaces of the fabrics.

[Printed, 4d. No Drawings.]

A.D. 1859, October 29.—No. 2474.

STANNET, CHARLES.—"Improvements in apparatus used in the manufacture of boots and shoes or other coverings for

"the feet." The first part of this invention relates to a machine whereby holes are pierced in the sole and pegs are inserted, "it may be at the same time or at a subsequent operation." The last (with upper, insole, and sole thereon) is fixed on a carriage, which is set on castors so that it may be moved in any direction on a bed whereon it stands, or is "fitted to move in cam grooves so that it may perform the motion required to bring the several parts of the sole under the instruments." The bed is capable of rising or falling ("to meet the inequalities of level of the sole") by means of springs or weights; it constantly forces the sole up to a stop, which "may be simply the spur or wheel which gives motion to the sole under operation." An awl, fixed in a stem "which receives a reciprocating motion by means of eccentrics, cams, or cranks," descends, pierces a hole, retires, and leaves time for a change of position in the sole. A shaft, which gives motion to the eccentrics, carries "a large wheel with ten or other number of teeth according to the gearing of the shaft." The wheel takes into a pinion (having ten teeth) fixed on a shaft which carries the spur before mentioned; and as it has "a diameter at the pitch line some five or six times greater than the pinion," the teeth have long spaces between them, and take into the pinion only at intervals, and the pinion "remains at rest while the blank parts of the periphery of the wheel are passing." By this arrangement time is allowed for piercing a hole and for inserting a peg. The awl "works adjacent to the spur," and the edge of the sole is held and guided by "a fence or guide." The wheel "operates on the pinion soon after the awl is clear, thus causing the spur to advance the distance from one hole to the next to be made," and thus holes are made all round the sole. In order that the last and sole may be "held up rigidly," two racks rise from the surface of the bed, and two spring catches take into them at the moment of piercing or of inserting a peg; the wheel gives motion to the catches and withdraws them.

The machine is also applicable for piercing holes in the sole and heel "in the flat, and before applying them to the boot or shoe." A fixed table may be employed; it should however be adjustable. Or the awl holder "may be adjustable according to the thickness to be pierced." The spring bed should move in guides, so that it may keep at all times a parallel position.

For inserting the pegs a tube "with a double oscillating " top " delivers one peg at a time, " which runs down a small shoot tube, so that the point arrives opposite " the hole made " by the awl." A presser descends "in the same manner as " the awl," enters the shoot, and drives in the peg. "If this operation is to take place at the same time as the piercing, the " peg tube is placed in the rear of the awl," so that the peg may be driven in "at the same time as the subsequent hole is " being pierced." If the pegging is to be "a subsequent operation" (which the patentee prefers) "it is necessary to use " a tooth wheel and a rack placed and fixed on the sole, so " that the motion given may be precisely the same in one " case as in the other."

The second part "relates to a machine for cutting leather, " which acts similarly to what is known as a fret saw." A steel blade kept in tension receives a reciprocating motion from a treadle or otherwise. The leather passes through a guide (fixed on a table), "which holds the leather above and " below," and keeps it in position whilst it is being pushed up against the cutting edge.

The third part consists of a machine "for cutting strips of " leather." The cutter is composed of two blades, one reciprocating, the other stationary. The leather placed on a table is advanced over the stationary blade and against a fence which regulates the breadth to be cut off; the upper blade descends and cuts off the breadth required." The leather is advanced "by weights or springs acting on a presser which abuts on " the rear edge of the leather."

The fourth part relates "to blocking soles and other parts " of boots and shoes." The leather is pressed on rigid forms or moulds by means of "a bag of shot or other granulated " material" of sufficient weight to impart the shape required or (as the patentee prefers) "with the further pressure of a " suitable press." The granulated material "assumes the " uneven surface required to be given," and presses equally over all parts.

The fifth part "relates to a hammer mechanically actuated " for hammering leather." It is mounted and worked "some- " what like a tilt hammer;" the force of the blow is regulated "by altering the fulcrum on which the hammer shaft or helve " moves, or by changing the point of attachment of the con- " necting rod by which it may be actuated with the helve."

The sixth part refers to "compressing and forming split and " other lifts of soles and heels" previous to their being applied to boots and shoes. Moulds, "in partial forms " of the parts required to be moulded," are fixed to "tongs " having great leverage." The leather is partially formed in the moulds and is afterwards subjected to the granulated material and pressure mentioned in the fourth part.

The machines described in the first three parts of the invention are explained at length in the Specification.

[Printed, 2s. Drawings.]

A.D. 1859, November 26.—No. 2677.

BEDELLS, CALEB. —"Improvements in the manufacture of " boots and shoes, and in fabrics suitable for use in this manufacture." The fabric used for the uppers is "a compound " fabric consisting of three fabrics cemented together," namely, an outer surface (usually a woven fabric of ornamental appearance or plain cloth or thin leather), "a thick non-elastic fabric " to give body to the compound," and a lining of white calico or similar material. Stiffening pieces "are laid at intervals " between the body fabric and the lining to give the necessary " stiffness at the heel." At the parts where the edges would appear, a finish is made "by turning the edges of the outer " fabric over the centre or body fabric" and running in a cord to give a fulness to the edge. Ventilation is obtained by perforating the compound fabric "with small points." The compound fabric may be made "in continuous lengths," and suitable pieces may be cut therefrom, or the pieces of each fabric may first be cut out and then cemented together. Sometimes uppers for shoes are made "without a seam."

The insole and the outer sole are united to the uppers by cement. The outer sole is sometimes made of several thicknesses of fabric cemented together. If the outer sole is to be of thick leather, the edge is to be perforated all round, and the holes are to be filled with gutta percha; the edges of the upper and insole are to be treated in like manner, and the whole are united by heat and pressure. Sometimes the outer sole is affixed by "short pieces of gutta percha cord" bent *into shape somewhat like a staple*; each piece passes through *two holes* in the sole and the upper, and "a cemented lining " made hot on a heated plate is then introduced and pressed

“down upon the points.” A surface of thin leather may be cemented on to the outer sole to hide the perforations, &c. The last must be made with a groove round the edge to admit the projecting points of the cord.

[Printed, 4d. No Drawings.]

A.D. 1859, December 8.—No. 2789.

MACINTOSH, JOHN.—“Improvements in the manufacture of “waterproof and other fabrics, and of moulded or formed “articles.” The patentee claims “the saturating or coating “sheets and other articles formed of fibres with collodion.” The invention is applicable to “a great variety of purposes,” amongst which are mentioned gloves, boots, shoes, tubes, cups, basins, and “other moulded or shaped articles.”

A batt of cotton or other fibre is “conducted into and “through fluid collodion;” or collodion may be applied to one or both sides of the batt “in any convenient manner.” The patentee prefers the use of a hopper and two rollers “applied at the bottom of the hopper,” or “two endless “aprons of wire cloth” for the reception of the saturated batt and then two pressing rollers. The collodion may be applied to one or both surfaces of the batt “by being applied to the “surface or surfaces of the roller or rollers.” Sometimes the collodion is put on “in a plastic condition.”

In “making articles of varied shapes,” the shape is first produced by pressing the batt on to a suitable form, and then the shaped article is dipped into a bath of collodion.

[Printed, 4d. No Drawings.]

A.D. 1859, December 14.—No. 2835.

CLARK, WILLIAM.—(*A communication from Messieurs Bibet, Léger, & Faury.*)—“A heating apparatus for boots “and shoes and other coverings for the feet.” The heating apparatus consists of a small lamp fitted into a hollow heel, and metallic tubes which convey heat therefrom between the soles, or a metal plate inside a leather sole and heated by the lamp.

The upper portion of the heel is perforated for sewing it on to the boot or shoe ; other perforations admit the "air necessary for combustion," and others allow "the passage of the warm air." The heel opens on a hinge, and the opening is kept closed by a thumb-screw. The lower portion of the heel contains a "receptacle for oil" which is kept closed by means of a "socket serving as a stopper." Below the receptacle is fixed a copper bottom or a "frame in which to place the leather terminating the heel." At the front of the upper portion of the heel there is a "metal plate for uniting solidly the sole to the heel by means of screws."

At the end of the Specification the inventors claim the invention of the foregoing arrangement, and "also the employment of a combustible sole placed between two metallic soles and burning that sole by igniting it, and arranging a suitable draught hole at the front part of the shoe."

[Printed, *6d.* Drawing.]

A.D. 1859, December 16.—No. 2866.

STOKES, HENRY. — "Improvements in boots, particularly applicable for military purposes." These boots are made in such a manner that they can be worn either outside or inside the trousers ; they are intended "to supersede the antigropelos now in use."

The leg of the boot is cut with the seam either at the front, side, or back, the side being preferred ; or "it may be blocked out of one sheet of leather without a seam but opened at the front, side, or back." The seam or opening is fastened with buttons, laces, hooks, or other contrivances. A gusset piece is inserted for the purpose of keeping out wet, dirt, &c. When buttons are used, it is desirable to have two rows of button holes, as when the boot is worn under the trouser, "it will wrap over considerably more" than when it is worn outside.

[Printed, *6d.* Drawing.]

A.D. 1859, December 19.—No. 2881.

HUGHES, EDWARD THOMAS. — (*A communication from Louis Letournel.*)—(*Provisional protection only.*)—"Im-

“ improvements in apparatus for cutting out the soles and counters of boots and shoes.” Matrices of iron or other metal with bevelled cutting edges are fastened together with screws; a piece of metal is placed between them “to keep them at the proper distance asunder.” The leather is fixed on a table or support; pressure is applied by mechanical means, and “the operation is completed at once.” A spring “on the top of the apparatus” forces out the sole, heel, or welt, after it is cut. One of the matrices “being furnished with teeth,” the seam is marked on the leather at the same time as the cutting takes place.

[Printed, 4d. No Drawings.]

A.D. 1859, December 28.—No. 2962.

ROSTAING, CHARLES SYLVESTER.—“Improvements in combining and mixing gutta percha with mineral and vegetable substances capable of altering its quality in such a manner as to produce hard, resistant, unalterable, and imputrescible compounds diversely coloured.” The patentee fills nearly a page of his Specification with the names of the articles which may be made from the combined gutta percha and the purposes for which it is applicable. In the list he mentions “soles for boots and shoes,” but no specific combination is described for such articles.

“The preliminary preparation” of the gutta percha is “the partial or complete purification” thereof:—To effect this, it is boiled in soft water, flattened into thin sheets, washed in cold water, boiled in a decoction of soap-wort, again formed into thin sheets, again washed in cold water, and dried. The complete purification is obtained by further boiling it for several hours in a “lie of soda, rendered caustic by lime or a mixture of soda and caustic potash,” again flattening it, again boiling it in soft water, again flattening it, again washing it in cold water, and finally drying it.

In the provisional specification we are informed that “more tenacity” may be obtained by mixing with the prepared gutta percha “cotton, hemp, or flax,” and that “Burgundy pitch, shell-lac, asphalte, concentrated tar, separately or combined may be admixed with the gutta percha according to the uses for which the compound is destined.”

The annexed sheets of drawings show views of the "rotatory machine for mixing processes."

[Printed, 1s. 4d. Drawings.]

1860.

A.D. 1860, January 4.—No. 20.

KLEIN, JOSEPH LOUIS EDOUARD, and ROGER, JULES PARFAIT.—(*Provisional protection only.*)—"A rotatory vice, "applicable for the manufacture of shoes and all objects of "art or industry generally made by hand." A globe of iron or other metal is pierced with "a series of holes situated at "different heights." The holes serve as sockets to hold "pincers or other similar tool" by means of "a handle fixed "to the said pincers." The handle is kept in position by a set screw; it can be turned in its socket. The globe turns upon a vertical axle "attached to a bar supported by the "pedestal or bench;" it can be raised or lowered and caused "to suit any degree of inclination desired from a vertical to a "horizontal one."

By the foregoing arrangement "the object can be turned in "any direction, or it can be held in any position," while the workman "has all his limbs at liberty."

[Printed, 4d. No Drawings.]

A.D. 1860, January 5.—No. 32.

SAMPLE, GEORGE.—(*Provisional protection only.*)—"Improvements in boots, shoes, clogs, and such like coverings "for the feet." The soles and heels are made of "wood and "leather," the waist of "leather only."

The upper is lasted in the usual way; a half-sole of wood is fastened thereto by sprigs or screws from the outside; a half-sole of leather is fixed to the wooden sole in like manner; a waist (which may extend under the heel part) is then secured to the upper by sprigs or nails; a heel of wood is nailed to the upper "from the inside;" and finally the bottom of the heel is covered with a piece of leather.

"By these means," says the inventor, "I obtain a cheap, "light, comfortable, and durable covering for the feet comparatively water-tight."

[Printed, 4d. No Drawings.]

A.D. 1860, January 11.—No. 69.

JOHNSON, CECIL.—(*Provisional protection only.*)—"Making a shoe without the use of leather." The sole is made of "hempen thread" plaited and "sewed together with thread" in the shape of the sole of a human foot. The plaits are sewed together "through the entire breadth of the sole in" three different places above each other, "so that when the sole" wears out up to the first time of sewing, "it is" held "together by the second," and when it wears out through the second it is held together by the third.

The upper is made of canvas; on the instep are "two holes" lined with brass; there are also other two holes, "one" behind the other, through which is passed a strong tape; this "crossing the foot twice over the instep is tied like a" sandal.

[Printed, 4d. No Drawings.]

A.D. 1860, January 25.—No. 187.

RAMSPACHER, THÉODORE, and SCHMIDT, CHRISTOPHE FRÉDÉRIC.—"Preparing wire gauze to render it applicable to" various purposes, among which are mentioned shakos, helmets, and soles for boots and shoes.

The gauze may be of various forms, either ordinary gauze or gauze "without weft," or gauze having the meshes "in part" filled with metallic substances, or "having its weft made" of a vegetable or animal substance.

The meshes are filled with molten metal, either by immersion or by the aid of the galvanic battery, and the gauze thus treated is covered with leather or other fabric.

"For most applications," the meshes are closed with gummy substances, such as "india-rubber, gutta percha, marine glue, linseed oil, fish glue, resins, tar," alone or mixed together; these substances are used hot or in a state of solution.

When the covering is put on, the whole is subjected to pressure.

[Printed, 4d. No Drawings.]

A.D. 1860, January 25.—No. 195.

LAMAR, JEAN PIERRE.—(*A communication from Charles Jarrin.*)—"Improvements in boots, shoes, and similar foot

" coverings, in fixing the heels and soles thereof, and in apparatus for forming and applying screws for the foregoing and other purposes." The first part of this invention consists in increasing the durability of boots and shoes by inserting screws from the inside; these protrude "below the under surface thereof sufficiently for the wearer to tread on them instead of on the leather or other material of which the sole or heel may be composed." Plates of metal or hardened india-rubber correspondingly threaded may be introduced for the screws to work through.

The second part relates to an apparatus which forms screws from a length of wire, fixes them into soles and heels, and cuts off the protruding portion:—A frame or carrier is worked up and down between standards of a fixed frame by treadles and a counterweight. The carrier supports a bracket (which carries the wire wound on a reel) and a friction roller for guiding the wire in its descent. A hollow spindle is supported by the arms of the carrier; it is screw-threaded on its outer face, "works in a nut and is provided with toothed or gear wheels, by turning which in one or other direction the spindle may be moved up or down." A tube passes down the spindle and rests on a die or screw plate attached to the lower end of the spindle. The wire passing down the tube arrives at the die, is formed into a screw, and then enters the sole or heel of the boot or shoe, which is presented to it on a last mounted on a frame or rest having adjustable parts. A nipper grasps the wire "and prevents it from turning when it has to enter the sole, but leaves it free when to be threaded." Shears "worked by a lever handle" cut the wire; the blades "may be bevelled to taper the end of the screw;" or a circular saw or other cutter may be used.

"For cutting cylindrical screws" the patentee proposes "to place within the hollow spindle at one end a square ferrule, collar, plug, or short tube with square orifice or passage through it, so that square wire when led through it is prevented from turning while being formed into a screw, but is free to be drawn on towards the die."

In certain cases the patentee uses screws of hardened india-rubber or gutta percha or combinations thereof, or similar substances.

The patentee describes the mode of working his apparatus.

[Printed, 8d. Drawing.]

A.D. 1860, February 9.—No. 348.

STUART, CHARLES.—(*Provisional protection only.*)—"Improvements in machinery or apparatus for the manufacture of soles for clogs, shoes, and pattens." Wood "of various lengths" is operated upon by a series of cutters, which are actuated by revolving cams "adapted to obtain the required forms for the soles" or such forms as will require but little finish when cut into separate soles.

The cutters have two motions, a rotary and a to-and-fro motion; the former is obtained by their being fixed on axles, the latter "by their axes being carried by sliding carriages operated by revolving cams." One cutter follows "the curves to produce the upper surface," another the under surface, whilst others give shape to the sides as well as "produce the gripping or recess or grooves to receive the upper."

[Printed, 4d. No Drawings.]

A.D. 1860, February 16.—No. 420.

CAPLEN, EDWIN.—"An improvement in the construction of soles and heels for boots, shoes, and other coverings for the feet." The object of this invention is to increase the elasticity of tread combined with increased durability," and at the same time to render the soles waterproof "and prevent them from slipping."

The boot or shoe is made with "an even single sole, but as it were unfinished or in the rough." Strips of elastic material (by preference vulcanized india-rubber) are cemented transversely, diagonally, or longitudinally, to a piece of jean or stout canvas, which is rather longer and broader than the sole. The bottom of the sole and the back of the piece are united with cement. Strips of leather or other material, of sufficient size to fill up the spaces between the strips of elastic, are then fixed on with cement or brads, and the edges, &c. are trimmed off. The heel is prepared and fixed in the same way. The waist not being subject to much wear and tear may be of india-rubber or leather in one piece.

It is not essential that the strips "should be attached to a linen basis." Sometimes the strips used are a little shorter, and an edging of leather is fixed to the sole.

The invention may be applied "to soles and heels that have
" been worn."

[Printed, 6d. Drawing.]

A.D. 1860, February 20.—No. 455.

EARNSHAW, JOSEPH, and GREEN, WILLIAM.—(*Provisional protection only.*)—"Improvements in machinery for forming
" blocks of wood into shape to be used as soles for boots,
" shoes, or clogs, or for other purposes." The machinery
consists chiefly of two parts, (1) a fixed headstock carrying a
revolving spindle and a face plate furnished with cutting tools,
(2) a traversing slide carrying the block of wood and capable of
being moved across the face plate and also nearer to or farther
from it. The bed on which the slide moves is provided with a
templet corresponding with the shape to be given to the block.
The slide is moved across the face plate by "a double-threaded
" screw which is mounted in the bed" and is turned by a
winch handle. A spring nut attached to the slide works on
the screw; it can be "withdrawn from the screw in order to
" bring the slide back without turning the handle." A pin
fixed in the slide passes into an opening in the templet, so that
as the slide traverses, the block is drawn farther from or
pressed nearer to the face plate.

"Almost any desired shape" may be given to the block by
varying the form of the cutters and the templet.

The same effect may be produced "by fixing several blocks
" of wood" on to the face plate or a drum, and by fixing a
cutter on to the slide, the cutter being acted upon by a tem-
plet of the required form.

[Printed, 4d. No Drawings.]

A.D. 1860, February 24.—No. 511.

WALKER, WILLIAM HENRY.—(*Provisional protection only.*)
—"Improvements in the manufacture of boots and shoes."
The "rasping, filing, scraping, burnishing, and polishing" of
the soles and heels are performed by means of rotatory rasps
and files and rotatory polishing and burnishing wheels or
surfaces, the whole being driven by steam or other power.
The rasps and files "for shaping and smoothing the under
" parts and edges of the soles and heels" are in some cases
"rounded and inclined on their peripheries," in other cases

"cylindrical," and "such is the case in respect to the rotating polishing and burnishing wheels;" they are all "mounted on suitable tables or frames." Guards prevent the tools which act on the edges of the soles and heels from coming against the uppers.

[Printed, 4d. No Drawings.]

A.D. 1860, March 6.—No. 613.

GEDGE, WILLIAM EDWARD.—(*A communication from Auguste Nicolas Jacquier.*)—(*Provisional protection only.*)—"Improvements in the manufacture of lasts and boot trees." The inventor adapts to the ordinary lathe "an oval platform or plate so disposed as to reproduce the different shapes of lasts which may be required." The lathe is supported on "a wooden staging" and is regulated by a moveable carriage.

The oval plate is of cast-iron and rests in "a groove of bronze;" "a bronze ring serves to attain the to-and-fro," and the groove "lengthens or shortens" as the plate may require. The oval is "regulated by the ring to which two T-s in steel are adapted by two recall screws;" the screws "regulate the T-pieces." Two wrought-iron slides "maintain the bronze groove," and the slides are "arrested by four buttons with six-sided heads."

A mandrel "having the form of a shoe last is fixed against the screw of the plate," and under the mandrel are pieces "supporting the last which is to be reproduced." The reproducing tool which is "in the shape of a gouge" finishes, that is to say, polishes the last; its to-and-fro movement is regulated by a spiral spring. "A pressure vase serves to fix the oval," and "the counterpoint of the lathe fixes" the reproducing tool. The counterpoint "is upheld by a cannon furnished with a hand recall screw."

The carriage may "travel without the aid of a pulley" and be set in motion by a handle; its cast-iron support "has two slides and two recall screws which serve to advance the reproducing tool."

[Printed, 4d. No Drawings.]

A.D. 1860, March 13.—No. 668.

WRIGHT, JAMES.—(*A communication from Philander Shaw.*)—"An improved method, means, and process of treat-

"ing wood, so that it becomes so changed as to be well "adapted for uses for which it is naturally unfit." Wood, when treated in the manner described by the patentee, will be found valuable as a cheap substitute for several materials, for example, for "leather in the heels and soles of boots and "shoes."

Blanks of wood are submitted to the action of high-pressure steam in a closed vessel; "by the condensation of the steam" there is obtained "a vacuum in the pores of the wood." There is then admitted into the vessel "in a fluid state, oily "or resinous or other waterproof material, or any metallic "or mineral salts, or other preservative chemical, or any "desired dye;" and if it is desired to have the matter forced through the wood, any required amount of pressure is applied to the contents of the vessel. When the blanks are taken out of the vessel, any moisture thereon and "any solvent of the "injected matter" are driven off by heat. The blanks are now compressed into moulds (by preference heated) "by a "screw or any other suitable means;" the "moveable parts" of the moulds are locked, "so that the wood cannot recover "any of its original bulk by virtue of its elasticity;" and the moulds with their contents when removed from the press are submitted to a temperature of from 200° to 500° Fahr., by preference in ovens.

The blanks and the moulds may be shaped to the article intended to be made, or they may be of any convenient size and form, and the blank can be shaped after compression.

[Printed, 4d. No Drawings.]

A.D. 1860, April 2.—No. 846.

JOHNSON, CECIL.—"Improvements in the manufacture of "shoes and boots." The uppers are made by preference of canvas or of strong woven fabric. The soles and heels are made of "yarns or threads of fibrous material, such as hemp, "flax, jute or others," plaited together according to the thickness of sole required. The boot or shoe is fastened to the foot by the aid of eyelet holes on each side of the front.

In order to make a sole the plaited material "is made up "into a flat coil," a filling piece of the material being introduced at the wider part under the tread; it is then sewn hori-

"zontally through from side to side," there being "two, three, or more rows of stitches, one above the other, according to the depth of thickness of sole." The heel is made in the same manner as the sole."

The uppers and the sole are sewn together. In some cases the upper and the sole are provided with eyelet holes so that they may be united by lacing; in such case a new sole can be readily applied to the upper.

[Printed, 4d. No Drawings.]

A.D. 1860, April 9.—No. 886.

HAMER, JOB.—"An improved manufacture of rugs, quilts, coverlets or covers for beds, and of certain articles of wearing apparel." This invention relates to various applications of silk waste, and the second part has reference to its application "to the manufacture of socks or inner soles or linings to be worn within boots or shoes."

Silk waste of various kinds (by preference winders' or weavers' wastes, or "other twisted and dyed wastes") is reduced into slivers, and these are made into rovings in such manner as "to put in an extra amount of twist and to give the roving the consistence of a soft cord." This cord is woven with a warp of cotton twist or other suitable yarn "into a fleecy or downy tissue." This fabric is attached to a suitable back, such as oiled or varnished cloth, felt, or haircloth; pieces of the required shape and dimensions are cut out therefrom and may be waterproofed or not.

[Printed, 4d. No Drawings.]

A.D. 1860, April 9.—No. 892.

BROOMAN, RICHARD ARCHIBALD.—(*A communication from Louis Nicolas Guillaume Dupont.*)—(*Provisional protection only.*)—"A new woven fabric and method of manufacturing the same." This fabric is "intended chiefly to replace strips of cloth used in making list shoes"; it is made with selvages, whereas the strips now used for such purpose "have no selvage, and are consequently liable to fray and unravel at the edges."

The warp threads are divided into groups, each separated by a small space. The groups are tied at intervals by weft threads

shot across them, and there are as many separate fabrics produced as there are groups of warps. The fabric is fullled as it comes from the loom; after fulling it should be stretched, and then be separated into narrow width fabrics by tearing or cutting the weft threads which unite the groups.

[Printed, 4d. No Drawings.]

A.D. 1860, April 11.—No. 904.

TURNER, THOMAS ALLEN.—“Improvements in manufacturing the upper leathers of boots and shoes.” This invention applies chiefly to upper leathers, the parts of which are sewn together by a machine; it is intended “to remedy the want of firmness in the sewing, and the liability of the sewing to become loose when one stitch is defective or injured.”

A strip of linen or other fabric coated with “a resinous or waxy composition” is inserted between the parts to be sewn together. The thread also is impregnated or coated with a similar composition.

For strong uppers the composition preferred consists of 1 lb. of beeswax, $\frac{1}{4}$ lb. of American tar pitch, and $\frac{1}{4}$ lb. of resin or carriers’ pitch, melted together with olive or sweet oil sufficient “to make a mixture that will set on cooling.”

For light uppers it is preferred to mix together one part by weight of beeswax and one part of white resin with oil sufficient to make the mixture soft or pliable.

The fabric is soaked in the composition (while hot); when cooled it is rolled smooth and cut into strips. The strips are brushed over with a mixture of one part by weight of copal varnish and one quarter of a part of melted india-rubber; they are then pasted on or between the parts to be sewn together, and after the sewing the upper is warmed.

If three layers are to be sewn together, “as in joining the two pieces and the lining,” two strips are required, one “between the edges of the top and lower pieces of leather,” the other “between the lower piece of leather and the lining.”

[Printed, 4d. No Drawings.]

A.D. 1860, April 24.—No. 1019.

WILKINS, EDWARD.—“Improvements in the manufacture of boots, shoes, and goloshes.” The uppers may be of any of

the customary materials ; if however it is not sufficiently waterproof, "an intermediate lining of oiled skin, ox bladder," or similar substance, is introduced between it and the ordinary lining.

The welt and the outer sole are of metal, by preference a mixture of tin and lead, or copper, or a mixture of tin and copper, or other alloy, "sufficiently elastic and flexible." The welt is riveted to the upper, and the outer sole to the welt. Instead of a mere welt a thin metal plate of the size of the inside of the boot or shoe may be used.

For "excessive wear," there is introduced underneath the ball or wearing part of the sole a plate of harder or stouter metal of from two to three inches long, and of the width of the sole.

The outside surface of the metal sole may be covered with leather, gutta percha, or other substance. The welt may be of leather. "The invention may be considerably varied in practice."

The golosh has "a vamp blocked and formed into the shape of the front of a Wellington boot and formed of thin flexible metal"; it may be secured to the boot or shoe in any "convenient manner." The metal may be lined, be covered with leather, or be japanned or otherwise finished.

[Printed, 4d. No Drawings.]

A.D. 1860, April 25.—No. 1041.

SEAGER, ROBERT.—"Improvements in the manufacture of boots and shoes." The soles and heels are made of "plastic matters, such as gutta percha or india-rubber," and are "simultaneously moulded and applied to the boot or shoe."

The upper, insole, and "a covering piece," are put on to a metal last and fixed to each other (by preference) with rivets. Clamping plates provided with guides are put on, their edges "entering under the edges of the covering piece"; the plates are held together by clips. The covering piece being coated with cement, a sufficient quantity of the plastic matter is put in a hot state on a plate or cover which is laid on between the guides. The whole is pressed until the projecting ridge of the cover comes down on to the covering piece. When the plastic matter is cool, the clamping plates and the cover are removed, and "the sole and heel will then to finish them require only to be trimmed round the edges."

Sometimes a projecting ridge is formed round the edge of each clamping plate, and the sole and heel are formed by pressing the plastic matter into the mould made by the ridges, "the form of the bottom of the same being given by a suitably formed plate or cover" pressed down on to the top.

[Printed, *ed.* Drawing.]

A.D. 1860, April 27.—No. 1067.

ROSSER, HENRY SHEPHERD.—"An improved sole to be worn in boots and shoes." In this sole "are embedded or otherwise applied two series of rows of metals relatively electro-positive and negative."

The body of the sole is made of gutta percha, hardened rubber, or other suitable material, and in it are embedded either crosswise or lengthwise strips of copper and zinc, or silver and zinc, "so that the metal may lie flush with the surface of the waterproof body." The two metals are separated by the material, and the whole may be covered with a lining of cotton or other fabric having perforations over the metal strips.

[Printed, *ed.* Drawing.]

A.D. 1860, April 27.—No. 1072.

SCARBOROUGH, JOHN VICKERS, and McMILLAN, DANIEL.—(*Provisional protection only.*)—"Improvements in the manufacture of boots, shoes, and clogs." These articles have wooden soles which "possess the same amount of elasticity and ease in bending as those made wholly of leather."

"A right-angled groove" for the admission of the upper and welt is cut "completely round the upper part of the sole." At the waist "a transverse groove is made through the upper part of the wood." The part cut out is about one inch in width and "extends downwards to the depth of the marginal groove." In the middle of the space thus formed a vertical saw cut is made partly through the wood. The transverse groove is coated with cement and is then filled with a piece of softened gutta percha, which when pressed down is "level with the upper surface of the wood." The upper is tacked down to the marginal groove, but the portion "which comes opposite the joint" is cemented on. The welt covered with cement is nailed on; it "is cut sufficiently wide to admit of its being turned down over the nails." The

sole "is now cut through at the unsevered part of the joint; this imparts "the same ease in bending the foot and elasticity "of tread as an ordinary leather sole." To prevent the sound of the wood, the sole and heel are faced with leather.

Another part of the invention relates to improvements in the one for which Mr. Scarborough obtained Letters Patent dated December 7th, 1858, No. 2804. The moveable toe piece which presses down the front part of the last "is connected to the "lower extremity of a vertical screw, which works through a "laterally projecting part of the adjustable presser." The toe piece is prevented from turning round by two pins, "which "stand up from the upper face of the toe piece and pass "through holes made in the overhanging arm of the presser." The under face of the toe piece is bevelled away, "so as to "fit accurately the lower part of the instep of the last." The heel guard is made with "angular projecting parts, which "slightly overlap the contiguous parts of the sole guard." These guards have their lower edges "turned inwards at right "angles to the vertical part, so as to prevent the formation of "a feather or projecting film of gutta percha upon the edge "of the sole."

[Printed, 4d. No Drawings.]

A.D. 1860, May 3.—No. 1115.

DAVIES, GEORGE. — (*A communication from Alexandre Joseph Duchatel.*)—"Improvements in the manufacture of "boots, shoes, and other coverings for the feet, and in appa- "ratus connected with such manufacture." The object of this invention is to abridge the process of riveting on soles and heels by "a simple mechanical operation by the aid of a "beam press, or other similar means of percussion, pressure, "or compression."

The apparatus required consists of a press, two plates carrying, one a set of pincers or awls, the other a like number of punches or hammers, a perforated plate which serves as a guide for the pincers and punches, and a matrix for holding the last.

The sole when cut into shape is damped and cambered between metallic moulds. The heel is curved inside and flattened outside by means of moulds of cast iron. The last is edged with metal, and carrying an upper leather and an insole is

placed bottom upwards in the matrix. The sole is laid on, the guide plate is placed on it, the piercer-carrier is brought down by the press, the holes are pierced, the piercer-carrier is raised and the punch-carrier is substituted for it, a rivet is put by hand into each hole, the punch-carrier descends and drives in and clinches the rivets. "The beating up or consolidation of the soles is effected by the same means and at the same time as the rivetting of the pegs, and the latter are levelled by means of a file or by a grindstone." The heel is fastened on in the same manner as the sole.

The rivets used are by preference grooved somewhat like screws.

[Printed, 8d. Drawing.]

A.D. 1860, May 9.—No. 1142.

KEMP, HENRY.—"Improvements in preserving wood, leather, iron, and other substances." These substances are preserved by the application to them of compounds made from peat tar, wood tar, peat oil, linseed oil, methylated spirit, sulphate of iron, sulphate of barytes, carburet of iron, resin, and arsenic, the ingredients depending on the substance to which the compound is to be applied.

"For the preservation of leather, that is, generally speaking, sole leather for boots and shoes, and hide leather for other purposes," the compound consists of one proportion of peat tar with two proportions of wood tar, sulphate of iron, resin, and methylated spirit. Sometimes "sulphuric acid in a very small proportion" is used "in the preparation of leather," but "as peat tar has it generally in combination from the manufactory it is seldom necessary to add more of it."

Sometimes the compound is applied with a brush; some- a slight pressure is used for injecting it; it is used in a heated state.

[Printed, 4d. No Drawings.]

A.D. 1860, May 26.—No. 1306.

DOWLER, GEORGE, and FARMER, GEORGE JAMES.—"Improvements in machinery for the manufacture of boot heels and tips, coins, medals, tokens, checks, and such like articles." The machinery is described as specially arranged for the manufacture of metal tips.

The principal parts are (1) two slides pressed outwards by springs and working in an inclined direction "through a box, " in which there are screws and bolts with friction rollers " fixed between the box and the slides;" each slide carries a roller which forces the metal when fed into the machine round

(2) A form suited to the size of the required tip.

(3) Shears; the arm carrying the moveable cutter "descends " and cuts off a suitable length from the rod or bar of metal " fed into the machine," while "at the same time the slides " are moved forward," carrying the piece out off round the form; the under cutter is carried by an "adjustable box " through which the rod or bar passes into the machine.

(4) A contrivance for removing the tip from the form:—A projection fixed in a toothed wheel acts (as the wheel rotates) upon a series of levers; the arm of the last lever fits round the back of the form, and "when acted upon jerks or throws " the bent heel or tip forward, so as to fall through an opening " in the bed plate into a suitable receiver."

The patentees also describe machinery "for pressing and " finishing" tips and the articles named in the title. The bent tip is placed in a die of (by preference) hardened steel. A cam actuates a lever, which causes a bolt (linked to it) to descend and sink the tip into the cavity of the die.

The Specification contains a full description of each machine.

[Printed, 1s. 10d. Drawings.]

A.D. 1860, June 2.—No. 1362.

SMITH, WILLIAM WILMER HENRY.—"Improvements in the " mode of and apparatus for preparing leather for harness " and boot and shoe manufacturers." The patentee prepares soles, insoles, and heels in the following manner:—

Soles and insoles:—The leather is stamped out according to the shapes and sizes required, using a press to force punches through the leather. The pieces are saturated with water, and are then subjected to pressure in a screw or eccentric press between heated plates or dies, "until the leather has " permanently taken the facial shape of the pressing surfaces." This will be effected in from 20 to 40 minutes if the dies are

heated to about 95° Fahr., and a pressure is maintained of from 40 to 80 tons.

Heels:—The leather is prepared in like manner, and the heel is made by piling up pieces and cementing them together. The sides or edges may be trimmed by means of rotatory files or rose cutters, and they may be finished off by the aid of rotatory burnishers.

As it is proposed to fasten on these soles and heels with brads, the required holes are pierced "by a suitable arrangement of drill stock."

[Printed, 4d. No Drawings.]

A.D. 1860, June 12.—No. 1436.

YATES, THOMAS CHADWICK.—"The manufacture of adjustable spikes for attaching to shoes or other coverings for the feet." The patentee, instead of screwing spikes into the soles and heels, makes a light framework of metal and vulcanized india-rubber to clip the sole and heel, and rivets spikes thereto.

The framework consists of a sole frame and a heel frame connected by a band of vulcanized rubber. Both frames are turned or hooked up to catch hold of the sides, toe, and heel of the shoe. The sole frame is jointed near the toe, so that by stretching the band transversely "it can be adjusted to different breadths of feet." The heel frame has attached to it a strap and buckle for fastening the whole firmly to the shoe.

"A flat metal spring" may be substituted for the rubber band, and the strap may extend from the heel to the sole frame, "so as to cover the india-rubber or spring and prevent its abrasion."

[Printed, 6d. Drawing.]

A.D. 1860, June 13.—No. 1448.

SPENCE, WILLIAM.—(*A communication from George E. Vanderburgh.*)—"Improvements in the mode of and apparatus for reducing silicious substances to a fluid state." The uses and applications of this "fluid or liquid silicate" are "too numerous to mention;" one is coating or saturating therewith the soles of boots and shoes for the purpose of rendering them waterproof and increasing their durability.

The silicious substance used is generally "clean sand" or

"silicious stones" reduced to a proper degree of fineness, and the alkaline substance is usually commercial potash or soda; the proportions are about 85 per cent. of the former to 15 per cent. of the latter.

The apparatus employed "may be of any suitable form and character, provided it be of the requisite strength," and the digesting portion be so arranged that "the silicious and alkaline composition to be placed therein can be retained, whilst in an undissolved state, in the upper portion of the digesting chamber, or be continuously raised above the surface of the liquid in the lower portion of the same, for the purpose of allowing of the admission of the superheated steam so as to act directly upon the said composition."

In the apparatus described by the patentee superheated steam is admitted by a central pipe and discharged into the digesting chamber "through slotted pipes at the end of radial arms," so as to act directly on the composition "as it is raised by revolving elevators." The digester has a double casing into which steam may be admitted, and pipes for drawing-off the water produced by condensation.

[Printed, &c. Drawing.]

A.D. 1860, June 25.—No. 1539.

DINSMORE, DAVID CROSMAN. — "Improvements in machinery for splitting leather and cutting the heels of boots and shoes." The improvements in machinery for splitting leather consist (1) in using rollers composed wholly or partly of india-rubber, gutta percha, or a compound of the two, or other pliable material, instead of the rigid rollers hitherto employed, for the leather to pass between, and (2) in forming the cutter "in one piece with two cutting edges," which may be set at any required angle to each other. The cutting tool is attached to a moveable and adjustable stock so that the cutter may be set in a position "to cut any desired width, or split any thickness, or bevel at one and the same time."

The improvement in machinery for shaping the heels of boots and shoes consists in making the cutter "somewhat in the form of a horse-shoe hinged at the toe." The lower part of the machine is a pillar carrying a table whereon are standards. On the standards are vertical rods (with helical springs round each) which support a frame to which the cutter

is screwed. The upper part of the frame is "a semisphere and fits into a cup." The sides and the back of the cutter are "adjusted by turnbuckles." The heel is secured on a bed beneath the cutter; the bed "is also resting in a cup and therefore accommodates itself to the downward action" of the cutter caused by a pedal.

[Printed, *8d.* Drawing.]

A.D. 1860, July 27.—No. 1829.

JEYES, JOHN.—"Improvements in the manufacture of boots and shoes." The object of this invention is to enable boots and shoes to be made by the aid of a sewing machine. The difficulty hitherto has been "adjusting the work to the machine when a welt of the ordinary description is employed."

The welt to be now used is "divided down the middle," so that it consists of two parts, "which at their outer edges are formed or cut to the contour of the outsole;" the inner edges "should come together and be joined to each other after they have been sewn to the upper," so that the welt will serve as an insole.

The upper is made in the usual manner; the lower edge of the upper and the outer edge of the welt are laid correctly together, "so that the lower edge of the upper when placed on a last will turn inwards, and the outer edges of the two parts of the welt will be outwards;" it is desirable to fix them together with cement or with long stitches whilst being stitched together by the machine. After the stitching a last is introduced; the inner edges of the two parts are sewn together; any filling is used; the outsole is then applied and held in place (whilst being sewn-on) by nails driven into the last in the ordinary manner.

Part of this invention consists "in applying a short knife or cutter to the lower one of the two pressing surfaces of a sewing machine;" it is intended "to puncture the leather of the outsole each time it descends to press the work between it and the lower plate;" its length is sufficient only to penetrate the surface of the leather "to an extent suitable for forming a groove or shallow cut all round the edge of the outsole for receiving the stitches;" its width is such "that its succeeding cut or puncture will extend into

“ the previous one,” so that although the cuts are made in succession, they will “ produce a continuous groove.”

[Printed, 10d. Drawing.]

A.D. 1860, August 3.—No. 1883.

NEWTON, WILLIAM EDWARD.—(*A communication from Marshall Jewell.*)—“An improvement in wooden soled boots “ and shoes, or clogs.” The soles are made of two pieces of wood, thus forming an inner and an outer sole of wood. The inner piece is somewhat smaller than the outer one in order that the latter may project beyond the former all around; its margin is slightly rounded on the under side “ to provide a “ neater finish” where the upper leather is united to it. The upper leather is nailed or screwed to the inner piece, and the outer to the inner with the margin of the upper between them. Sometimes the whole are united by the same set of nails or screws, and sometimes by “ suitable waterproof adhesive “ material.”

[Printed, 6d. Drawing.]

A.D. 1860, August 7.—No. 1906.

CLARK, WILLIAM.—(*A communication from Marie Céline Gobert.*)—(*Provisional protection only.*)—“Improvements “ in pattens or clogs and coverings for the feet.” This article is termed “the countess hygienic clog or patten.” The sole is of metal or other material either hinged or elastic or rigid; it is raised from the ground by a “projecting ridge “ piece,” all round of open work and more or less ornamental. “Ornamental open work ridges” are carried round above the sole “to grip the heel” and the toes. The clog may be fastened on by a strap or otherwise. The ridges which project downwards have “roughened contact surfaces” or “notches or other arrangement” to prevent slipping.

[Printed, 4d. No Drawings.]

A.D. 1860, August 9.—No. 1934.

PARKER, FRANCIS.—(*Provisional protection only.*)—“Improved coverings for the feet or parts thereof, suitable more “ especially as foot warmers for railway and other travellers.” This article, intended to keep “the forepart of the foot” warm, consists of a half-slipper “well lined with warmth-giving

"materials, as wool, fur, hair, and the like;" it may have either a half or whole sole attached, and it is held on the foot by an "elastic band being drawn over the heel" or by a non-elastic strap and a buckle or button. The vamp may be made of various materials.

[Printed, 4d. No Drawings.]

A.D. 1860, August 13.—No. 1954.

NORRIS, STEPHEN, and ROGERS, ROBERT. — "Improvements in the manufacture of boots particularly adapted to military purposes." These boots when worn "have all the appearance and comfort of Wellington boots;" this is effected by cutting the front and back parts in such manner that the opening between them before the seam is sewn "shall resemble the shape of the letter V," but when closed "will form a straight vertical seam." The tongue of the front part is cut "hollow instead of round," and "the front part of the backs rounded instead of straight," the object being "to prevent the tongue slipping down." The side seams are made "near the heel, the same as in the Wellington boot," or "another seam may extend from the vertical seam in an inclined line towards the toe."

Another "important feature" in the invention is making boots for trench work, mining and shooting purposes, &c.; these boots extend up the leg and fit close, "thus forming a gaiter on the boot either of soft or other leather."

Several figures in the annexed sheet of drawings shew the vamps, quarters, and gussets, cut into the shapes required for long and short boots.

[Printed, 10d. Drawing.]

A.D. 1860, August 20.—No. 2007.

NEWTON, ALFRED VINCENT. — (*A communication from William Andrew Harris.*)—"An improved guard for boots, shoes, and clogs." This guard, intended to protect the bottoms of ladies' skirts and gentlemen's trousers from mud, &c. thrown up in walking, consists of a curved piece of india-rubber, leather, or other material; it is applied to the back of the boot or shoe, "and set at an inclination outwards, so as to lap round it and overhang the heel at about the thick-

“ness of the heel from the ground.” The guard may be a fixture or be made removable; it may be of any size or shape “adapted to remedy the splashing of mud on the clothes “in walking;” it resembles a hood when attached to the boot or shoe.

[Printed, 6d. Drawing.]

A.D. 1860, September 7.—2162.

STEVENS, CHARLES. — (*A communication from Antoine Bouet.*) — “An improved impermeable oil varnish.” This varnish possesses advantages over those at present in use; it “gives a brilliant polish to shoes” and to all kinds of leather; it renders them “extremely pliable” and preserves them “from humidity.”

The ingredients and proportions employed in the composition are 100 parts of alcohol, 100 parts of spirits of turpentine, 1 part of sulphuric ether, and one part of carbonate of soda.

The varnish may be coloured; it is usually “white and clear.”

[Printed, 4d. No Drawings.]

A.D. 1860, September 13.—No. 2208.

WRIGHT, JAMES. — (*A communication from Lyman Reed Blake.*) — “Improvements in the construction of boots and “shoes.” The improvements relate to the method of uniting the outer sole to the vamp and insole. For this purpose the patentee employs the machine for which he obtained Letters Patent dated May 3rd, 1859, No. 1111. The machine “operates “with a hook or crochet needle, which pierces the inner and “outer soles and vamps from without the shoes (the last “being removed) and unites the said parts by a seam formed “by interlacing loops of the same thread without drawing the “end or ends and the unused length of the thread through “the parts every time a stitch is formed.” The sewing is of the description usually known as “the chain or tambour stitch.” The sole may be channelled on the outside, so that the interlocking of the loops is drawn into the groove and covered from sight, “while the plain side of the seam comes within the shoe “against the foot.”

[Printed, 6d. Drawing.]

A.D. 1860, September 15.—No. 2249.

BARNWELL, STEPHEN, and ROLLASON, ALEXANDER.—

“Improvements in combining and mixing certain solutions of pyroxylyne with animal, mineral, and vegetable substances, by which its quality is altered in such manner as to produce hard, resistant, adhesive, plastic, or resilient compounds and articles unalterable in their nature and varied in colour, which said compounds in a state of solution may also be advantageously employed as paints or varnish.” For the manufacture of pyroxylyne the patentees prefer to use “common rags of any description, plain or coloured.” The material is submitted for from 20 to 24 hours to the action of “the mixed acids, nitric and sulphuric.”

The acids are then drawn off, and “the bulk is then to be thoroughly and evenly mixed and boiled, then analysed, and the loss of strength ascertained;” the loss is to be made up by the introduction of fresh acids, “when they may be re-used.”

A very useful description of the same article is obtained by submitting fibrous and other matters containing cellulose to the action of mixed acids of such modified strength and temperature that they will be only partly converted into pyroxylyne; this forms a kind of half-stuff.

The pyroxylyne and the half-stuff must be freed from acids and dried “before advancing to the further processes.”

According to the use to be made of the compound, some of the following ingredients are mixed with the pyroxylyne:—Oils, essential, animal, vegetable or mineral; gums, resins, balsams, tar, pitch, bitumen cements, wax, tallow, grease, caoutchouc and gutta percha; ivory and bone dust, powdered bark, farinaceous and amylaceous substances, starch and dextrine; pigments and bronzes; chloroform, bisulphide of carbon, ether, alcohol, anhydrous basic salts (that will in any way combine with it), iodide of potassium and cadmium, and oxides of metals for imparting colour.

The applications of the compounds in a state of solution or in a plastic state are very numerous, “far too numerous to be particularly classified;” a solution of pyroxylyne may be used as “a coating for hat-bodies, for boots, shoes, and leather in general.

[Printed, 6d. No Drawings.]

A.D. 1860, October 18.—No. 2542.

WILLIAMS, HENRY.—(*Provisional protection only.*)—"Improvements in the manufacture of boots." The first part of this invention relates to the tongues of laced boots. The tongues are narrow pieces of leather and are fastened outside the uppers. On each side of the openings, about an inch from the edge, are sewn flaps enclosing the edges of the tongues and having the lace holes. The flaps prevent wet from getting into the boots, and should any penetrate between the flaps and tongues, it will escape "through openings formed at the lower part of the flaps."

The second part consists in forming the toe cap "with a golosh on each side thereof" for the protection of the fore part of the foot from wet.

[Printed, 4d. No Drawings.]

A.D. 1860, October 20.—No. 2564.

MARGETSON, PAUL.—(*Provisional protection only.*)—"Improvements in boots," which lace in front. A flap of leather is attached to the exterior of the boot; it "folds over so as to cover the lacing, and is itself secured by a strap and buckle, a lace, or otherwise."

The flap serves "to throw off the water," and "renders the appearance of the boot neater."

[Printed, 4d. No Drawings.]

A.D. 1860, October 29.—No. 2646.

STOCKER, ALEXANDER SOUTHWOOD.—"Improvements in the manufacture of horse and other shoes, and in the machinery or apparatus to be employed therein, part of which improvements are also applicable to metal boot heels and various other articles." The patentee describes his invention principally in the mode of producing "an article commercially known in the market as a Scotch heel tip."

The metal used is iron or steel or steel iron, rolled into shape either alone or in their amalgamated or combined state. Two rollers are required; on the one there is cut or sunk all around the surface at convenient distances apart a series of suitably shaped dies. The metal is forced into the dies by the pressure of the other roller, and the articles thus formed "are held together by a thin web or waste."

The web is cut away "by a pair of tools commonly known as "clipping tools, which may be fixed in a fly or other press"; the configuration of the tools at their cutting parts is "of the "precise shape of the article intended to be divided or cut "out of the web." The tools are made of "malleable cast "iron," and they are used "in their hard and unannealed "state, viz., from the natural castings." The articles may be finished "in any ordinary and well-known method."

The patentee explains several methods of making the rollers, adding that "they may be made in various ways without departing from my invention." He mentions as a substitute for rollers "a segment of one circle working to and fro or "backward or forward motion upon or over a flat planed "sliding bed."

More durable articles are made from "iron and steel iron "welded together."

Another part of this invention consists in dividing or partially dividing bars of iron into lengths suitable for shoe heels or toe tips by fixing cutters at certain distances apart "in the present "ordinary rolls as now used for rolling what is called tip "iron."

[Printed, 4d. No Drawings.]

A.D. 1860, October 31.—No. 2665.

DAVIES, GEORGE. — (*A communication from Alexandre Joseph Duchatel.*)—"Improvements in the manufacture of "boots, shoes, and other coverings for the feet, and in apparatus "connected with such manufacture." The first part of this invention relates to stretching the upper leathers of boots and shoes by mechanical means:—The last with the upper and the insole thereon is held (bottom upward) by supports in a frame. Into each side of the frame are tapped screws to whose inner ends pincers are hooked. The pincers are attached to the edges of the vamp, the screws are turned, the pincers are drawn outwards, and the upper is stretched. In order to stretch the vamp still more the frame "can be rocked upon "pivots at each end." Each support "is traversed by a "screw;" one screw supports the toe of the last by the aid of a cross-head; the other works in a nut let into the last and tends to draw it downwards. To prevent the pincers from

creasing the leather "they are raised out of contact with the " inner sole by means of a half-round rod" which is placed on the middle of the last. To rock the frame a "gudgeon or " pin" must be disengaged.

A modification of the foregoing may be made "by substituting levers for the screws." The pincers also may be constructed "to hold the vamp firmer the more they are " pulled."

The upper and the insole are now prepared for the attachment of the outer sole; this may be fixed on by the process described in the Specification of Letters Patent granted to Mr. Davies on behalf of Mr. Duchatel, dated May 3rd, 1860, No. 1115, "or in any other suitable manner."

The second part consists in preparing "half-soles and " heels" by piercing holes in them and corresponding holes in the soles and heels of boots and shoes, so that any person may affix the half-soles and heels by means of screws. These can be taken off when worn and be replaced by others, "the " original sole and heel of the boot or shoe not being subject " to any wear at all."

[Printed, 10d. Drawing.]

A.D. 1860, November 1.—No. 2667.

REYNOLDS, WILLIAM, and SAMSON, GEORGE ALFRED.—*(Provisional protection only.)*—"Improvements in the manufacture of boots and shoes." The inventors introduce into the waist a spring of metal, whalebone, or other elastic material "to assist the proper action of the foot and to give greater ease " and comfort in walking."

They prefer to make the spring of flat steel about one-sixteenth of an inch thick, one inch wide, and six inches long. The spring has at each end a longitudinal slot or a slot at one end and a circular hole or holes at the other; they imbed it in the leather of the waist so as "to form a shank or foundation " for the sole and heel;" they pin or rivet one end into the interior of the heel and the other into about the middle of the sole, thereby preventing "all side movement" but allowing "the requisite play of the spring."

[Printed, 4d. No Drawings.]

A.D. 1860, November 6.—No. 2732.

SALISBURY, EDWARD.—(*Letters Patent void for want of Final Specification.*)—"An improved mixture or solution to be applied to pickers, picking bands, straps, sole leather, and such like materials in order to harden them and render them more lasting." A quantity of lime is dissolved in about twenty times its weight of urine. The soluble portion is drained off and mixed with about an equal amount of oil.

The materials are put into the mixture and allowed to remain in it for some days, the time varying "according to the mass and the kind of materials;" they are then taken out and exposed to the action of the air for a few days.

[Printed, 4d. No Drawings.]

A.D. 1860, November 21.—No. 2849.

JOHNSON, JOHN HENRY.—(*A communication from Dufay Brothers and Company.*)—(*Provisional protection only.*)—"Improvements in the manufacture of boots and shoes and of a new material to be employed therein, which material is applicable to various other useful purposes." The inventors make a "leather maché or artificial leather" which they use for "stiffeners and soles for boots and shoes."

This artificial leather is composed of parings of leather or skins (tanned or raw) well steeped, then lixiviated or washed in lye (the latter process may be dispensed with if desired), then mixed with gelatinous or mucilaginous matter, afterwards ground down or reduced to a pulp, and finally rolled into sheets and dried.

[Printed, 4d. No Drawings.]

A.D. 1860, November 23.—No. 2869.

MONKHOUSE, ELLIOTT.—"Improvements in the construction and manufacture, and the fixing or fastening, and the mobility, adjustment and re-adjustment of circular and polygonal heel plates for boots, shoes, and clogs." The heel plate is by preference circular, and is made "with a solid boss underneath the centre." The boss is intended "to fit tightly into a corresponding hole in the boot, shoe, or clog heel, whereby it acquires firmness to hold it in its seat." A hole drilled through the boss admits a screw which fastens the

whole to the heel; one screw is sufficient, but more may be used by drilling holes through other parts of the plate; the hole or holes should be countersunk to prevent the heads of the screws from wearing.

The heel plate is usually made of metal, but the patentee does not confine himself to any material or combination of materials.

When one side of the plate is worn down, another can be brought into wear by slightly loosening the screw.

These heel plates may be fitted to all kinds of low-heeled boots and shoes by the addition of a round heel of wood, gutta percha, or other substance. This heel is fastened to the boot or shoe from within, and the heel plate is screwed to it.

[Printed, 4d. No Drawings.]

A.D. 1860, November 23.—No. 2876.

BARTHOLOMEW, GEORGE.—(*Provisional protection only.*) —“Improvements in boots, shoes, clogs, and goloshes,” which are made of “leather or other non-elastic or but very slightly “elastic material.” The improvement consists in applying prepared india-rubber or other suitable elastic substance “externally between the heel or posterior part and the back or “posterior part of the upper” to give freedom to the motion of the foot. The lining is “as heretofore but unconnected with the heel or posterior part.”

[Printed, 4d. No Drawings.]

A.D. 1860, November 27.—No. 2911.

FOWLER, JOHN.—(*Letters Patent void for want of Final Specification.*) —“Improvements in boots, shoes, gaiters, “leggings, and overshoes.” Gussets or gores of elastic fabric are inserted in such manner as to avoid “the objectionable “appearance” of such gussets, &c. and “the liability of their “wearing out from outward or inward friction or in cleaning.” Moreover, the invention includes the application of elastic laces to all the articles named.

Rows of eyelets are fixed at the opening for lacing up, and these are threaded with elastic cord. Underneath the opening is a breadth of elastic fabric, and “to prevent such being acted “upon by the stockings or socks or legs of the wearer,” the

customary lining is slit "to allow its opening with the expansion of the gusset." When the article is laced, the material of which it is made must cover the elastic fabric.

[Printed, 4*l*. No Drawings.]

A.D. 1860, November 28.—No. 2927.

JEYES, JOHN.—"Improvements in the manufacture of boots and shoes." Instead of sewing the upper to an insole and a welt as is generally done, or of fixing the upper to a welt and outsole as was described in the Specification of Mr. Jeyes bearing date July 27th, 1860, No. 1829, the upper is "fixed at its lower edge to the edge of a welt or interposed piece so as to admit of such lower edge of the upper being turned outwards and be itself sewed to the sole."

When the upper has been blocked and sewn to the welt, the last with the insole pegged thereto is introduced. The under side of the insole is coated with cement or paste, and it is preferred that the edges of the insole "should be cut square or at right angles to the under surface."

"In order to prevent the drag of the stitches (by which the outsole is fixed) acting prejudicially on the edge of the upper," a narrow strip of leather is laid on the upper surface of the edge of the upper and is sewn in with the upper, the welt, and the outsole. Sometimes this strip is put on with the first row of stitches (which secures the upper to the welt), and by turning the strip back the outsole can then be sewn on, and the strip then returned to its place, and thus form a shield or protection to the stitching of the outsole."

In light boots and shoes in which there is not an outsole, a groove to cover the stitches must be cut on the under side of the single sole.

If the boots and shoes are made by aid of a sewing machine, the thread is not to be waxed; when the upper and welt are sewn together, a solution of cobblers' wax "should be applied to the surfaces where the stitches come;" at the same time it is desirable "to extend the use of such solution, particularly on the under side of the welt so as to present a cement between it and the outsole." The thread used in fixing the outsole will pass through the solution and be partly waxed thereby.

The outsole may be fixed on with pegs.

[Printed, 8*d*. Drawing.]

A.D. 1860, December 17.—No. 3100.

TAYLOR, JOHN GEORGE.—“Improvements in the manufacture of boots and shoes, and in the method of measuring the human foot for fitting the same.” The first part of this invention consists “in pressing or expanding and ornamenting the heads of plastic and impressible fastenings, such as leather or gutta percha,” after they have been inserted into the sole:—Punches, formed with a shoulder to regulate the depth of the impression, are used, and the effect is produced by pressure or a hammer. The heads of the fastenings are driven in slightly below the surface of the sole and are “ornamented and also expanded and hardened simultaneously.” The operation may be performed by hand or machinery.

The second part consists “in the employment of reflectors or mirrors;” these are so adjustable that “the workman is enabled more readily to see the various parts of a boot or shoe when lasted upon a stand” and to adjust the parts without moving the last from its original position.

The third part relates to a method of obtaining a correct measure of the foot;—Tapes, strings, or slips of paper are attached at suitable positions to “a piece or foundation of paper or other suitable substance.” The foot is placed on the foundation; the tapes are fastened over the foot; the foundation is put on a damp cloth; the foot is pressed thereon; the tapes are marked or cut; the foundation is allowed to dry, and “the exact dimensions of the foot” are thus obtained. The foundation may be coloured and the cloth be “slightly impregnated with bicarbonate of soda or other suitable discharging agent;” or the foundation may be white and the cloth be damped with a coloured liquid.

[Printed, 8d. Drawing.]

A.D. 1860, December 26.—No. 3163.

DESBOROUGH, SPENDLOVE, and MIDDLETON, SAMUEL.—“Improvements in the manufacture of boots and shoes and in the means and apparatus employed for uniting and preparing surfaces of leather and similar materials for this and other purposes.” The first improvement consists of an apparatus “for pressing, lasting, and turning over the under edges of the uppers of boots and shoes when shaping or

"making up the same upon the last;" it applies especially to "seamless uppers." A metal box or mould is formed with a recess of the shape of the intended upper. A flat piece of leather (tanned but not stretched and finished) is placed over the recess; its edges rest on the surface of the mould, and are held down by a clamping plate which is made with an aperture of the same outline as the upper edge of the recess. The last (with the lining and stiffening secured thereon) is put in an inverted position into the aperture; the mould is placed in a press, and the last being forced down causes the leather to sink into the recess. On removing the mould from the press, the flat edges of the upper "are raised into a vertical position;" the insole is laid on the last, and the edges of the upper "are tucked down" upon the last, or they may be pressed down with "an upper die or tool." The last with the lasted upper thereon can be pressed upwards out of the mould by a lever whose end works through a hole in the recessed part of the mould.

The patentees describe another arrangement of apparatus "similar in principle to" the foregoing.

The second improvement consists in using pegs of "horn or the hoofs of animals, bone, vulcanite, or similar materials," for uniting surfaces of leather. The pegs may be cut by hand or by suitable machinery, and the patentees prefer to form them "with jags or slots."

The third relates to metal pegs:—To these they give "a screw or twisted form" as well as jags or slots. Sometimes they point pegs at each end and bend them in the middle "so as to make a staple."

[Printed, 1s. 2d. Drawings.]

A.D. 1860, December 29.—No. 3187.

BURNHAM, EGBERT REUBEN.—"Improvements in apparatus "or machinery for stamping, shaping, or forming certain "kinds of goods manufactured of india-rubber, gutta percha, "and like substances." This invention relates more particularly to stamping, shaping, roughening or ornamenting india-rubber and gutta percha soles for boots and shoes, and consists of machinery which may be worked (1) by hand, (2) by other power.

The hand machine "is similar in construction and operation " to a hand-punching machine or letter-copying press with the " addition of hollow chambers above and below or on either " side of the open space" where the material is placed. The stamping, &c. is effected by pressure from engraved dies fastened to the chambers, one of which is moveable, the other stationary. The chambers are made suitable for receiving steam or heating irons so that the material "can be placed in " the machine in a cold state in lengths, to be afterwards cut " out, or in pieces." Or the material may be passed between heated rollers and the dies be used cold. In either case the material "may be carried forward or to and through the " machine on a band or plate" having motion communicated from the machine and "capable of being regulated by set " screws to any suitable travel."

The machine to be worked by steam or other power "is " similar to that last described, the difference being in the " mode of obtaining the pressure." On the driving shaft are cams or eccentrics "which press against and give the necessary " force at successive intervals to the die and hollow moveable " chamber, both of which latter are returned for the next " pressure by connexions to the main shaft or by springs." The material is carried forward to and between the moveable die and the stationary one on an endless band.

The machines and two modifications of the power machine are described at length in the Specification.

[Printed, 1s. 10d. Drawings.]

1861.

A.D. 1861, January 4.—No. 21.

WRIGHT, JAMES.—(*A communication from E. T. Green.*)
—(*Provisional protection only.*)—"Improvements in ma-
" chines for forming the heels of boots and shoes." The heel
is shaped by this machine after it is fixed to the sole. The
last with the boot or shoe thereon is placed on a stand "capable
" of longitudinal and vertical adjustment." The cutting ap-
paratus is mounted above the stand; it consists of "a heel

"made of hardened steel" and a knife "formed to the exact "curve" of the boot or shoe heel; the former is "of the same plan or form as the bottom of the heel of the boot or shoe "is intended to be," and is arranged to rise and fall as required; it serves as a guide against which the knife is kept by a spring. The knife "is fixed in a frame adjustable by screws "so as to take different sized heels;" it is moved by a lever "having its axis round the fixed spindle which supports the "boot heel."

The last being adjusted so that the middle of the heel thereon comes exactly under the middle of the steel heel, the latter is screwed down upon the boot heel, and the knife being actuated "removes all the leather which projects outside" the steel heel.

In order to fix the last more readily, the upper part of the machine is made "capable of being thrown back" and of being "fixed by the same motion which fixes" the last.

[Printed, *ad.* No Drawings.]

A.D. 1861, January 21.—No. 164.

HIBLING, HENRY.—"Improvements in the manufacture of "high boots, gaiters, knickerbockers, leggings, and other such "like articles." The patentee makes these articles in such manner that the same pair "may fit the legs of various sized "persons."

The leggings and leg parts of high boots are made "of one "piece of material," but when required to fit the shape of the leg "in two pieces;" in either case "the edges (at the line of "junction) are to overlap." A spring is placed round the top or bottom or both; so that the leggings "may adhere closely "to the legs of the wearer and remain securely attached." There is also "a sliding adjustment" placed upon the leggings; it is provided with a set screw "to retain the leggings in their "places when once drawn tight round the leg." A like adjustment is applicable to high boots, so that they may be worn "either under or outside the trousers." Sometimes "a band "of suitable material" is employed; holes are perforated therein on one side of the legging for the reception of a hook on the other side. Sometimes a metallic spring is "placed "perpendicularly on the outside edge with projecting ends "which take into spaces formed by the sewing of a strap at

“top and bottom at intervals.” Other modes of fastening may be used.

[Printed, 4d. No Drawings.]

A.D. 1861, January 23.—No. 179.

WESTLEY, WILLIAM.—“Improvements in the manufacture of boots and shoes.” The patentee claims three improvements; (1) a mode of fixing heels (by preference of wood) to soles, (2) a mode of constructing waists, (3) moulding lifts of leather for forming heels.

1. The heel is cut with “a dovetailed fillet or groove round the edge of the upper face.” A similar fillet or groove in the sole fits into the one of the heel. The heel is “slipped on to the grooved portion of the sole and secured by a screw, pin, or peg.”

Or a metal plate with its edge turned up may be fastened to the top of the heel, and to the sole a plate “formed in the reverse way” and having a tongue which projects into the waist.

2. Steel springs are introduced between the inner and outer soles.

3. Strips of leather, “in length equal to the periphery of the heel to be made and in breadth so as to give a proper area,” are saturated with water, put into a mould, and subjected to pressure until they take the form required. If any space is left in the middle, it is filled up with gutta percha or other substance.

[Printed, 6d. Drawing.]

A.D. 1861, January 30.—No. 248.

BOUSFIELD, GEORGE TOMLINSON.—(*A communication from John C. Plumer.*)—“Improvements in the manufacture of lasts for boots and shoes.” The object of this invention is to obviate the defects of lasts now in use by producing one which shall conform to the bony and ligamentous structure of the natural naked foot when the heel is elevated above the ball of the foot a distance equal to that produced by the rise of the boot or shoe heel.”

The middle portion of the bottom of the last is made concave, and this concave portion “is embraced laterally by

"two longitudinal protuberances," one of which corresponds "with the ball of the great toe," the other "with the ball of the two small outermost toes." The concavity extends forwards to the toe and backwards towards the heel; the protuberances decrease in prominency as they extend toward the toe and heel. The under side "of the middle division of the last in advance of the heel" is highly arched upwards, and the instep "is made prominent in a corresponding degree to suit the girth of the foot at this part." The butt of the heel is rounded off "with a circular curve," and "the transverse section of the heel" is also rounded off. The sides of the last at a line (drawn slanting from about the middle of the concavity to the top of the heel) are concave, "the concavity gradually vanishing into the convexity of the heel as it extends backwards, and into the part of the last anterior to the line as it extends forwards."

Although the feet of no two persons "are absolutely identical in form," nevertheless the proportions of the foot "follow certain general rules;" these rules are explained in the Specification, but as they require a diagram to make them clear, the reader is referred to the annexed sheet of drawings for the explanation."

[Printed, 1s. Drawing.]

A.D. 1861, January 30.—No. 250.

BOUSFIELD, GEORGE TOMLINSON.—(*A communication from John C. Plumer.*)—"Improvements in the manufacture of boots and shoes." These boots and shoes "conform to the bony and ligamentous structure of the natural foot," and the improvements claimed are (1) "the combination of a sole that is flat or convex exteriorly with an insole that is convex at its upper surface," (2) "a shank that is convex at its upper surface," (3) "the combination of an elongated heel with the sole," (4) "the combination of the front piece of the upper leather with quarters of unequal length."

The inner and the outer sole are separated by a filling of such form that the upper surface of the middle portion of the insole "protrudes into the shoe above the lateral portions," whilst the outer surface of the outer sole "is slightly convex as usual." The protrusion of the insole "corresponds with the rise of the central portion of the transverse arch of the

“foot, so that this arch is prevented from being broken down
“by the constriction of the upper leather.”

The filling gradually decreases in thickness as it approaches the toe; it extends towards the heel through the shank “so
“that the upper surface of the insole of the shank is convex
“while the external surface of the shank is also convex.”

The heel “is extended forward,” and “its anterior part is
“raised to support the insole;” its front edge may be extended
“to a distance from the heel of the shoe equal to one-third of
“the whole length of the shoe;” it may be cut away behind
so as to diminish the length of the sole and heel.

As the front portion of the sole beneath the ball of the foot
“is not shifted forward by this extension of the sole,” the
shank “is shorter than the shanks of shoes hitherto made,”
and may be more flexible than usual.

“In order to afford a firm lateral support for the heel,” the
heel at the periphery “is raised above its central portion,
“thus forming lateral rims.”

The quarters are of unequal lengths; that on the inner side
extends forward from the heel “about three-sevenths of the
“total length of the shoe;” the other is much shorter, “as a
“general rule the distance of its front edge where it meets
“the sole from the heel of the shoe should be about one-third
“of the total length of the shoe.”

[Printed, *8d.* Drawing.]

A.D. 1861, February 1.—No. 271.

DE ARRIETA, José Joaquín.—“Applications of chapapote
“and its products, and of the same combined with other sub-
“stances, and of materials treated therewith, to various pur-
“poses in manufactures and the useful arts.” The patentee
utilizes “a certain natural matter called in Cuba chapapote;”
it is “taken either in its natural state, whether concrete or
“solid, viscous, pasty, or more or less fluid, or in the condi-
“tion of crude oil or other oil or product thereof, and combined
“or not with its own or other oils, also with lime, burnt or
“dried clay, powdered brick, or argillaceous, aluminous,
“silicious, or earthy substances, wax, turpentine, gutta percha,
“caoutchouc, resins, gum resins, fatty matters, alcohol, wood
“spirit, hydrocarbons and varnishes, also with agents for
“resisting combustion, and other agents.”

As regards the present series, the patentee informs us that
 "a strong fabric may be manufactured by coating or saturat-
 ing paper, pasteboard, or the like, or textile, felted, and
 fibrous fabrics, with the chapapote suitable for gas and water
 pipes, tanks and other fluid vessels, military accoutrements,
 soles and linings for foot coverings," and other purposes.

[Printed, &c. No Drawings.]

A.D. 1861, February 5.—No. 298.

PATON, WILLIAM.—"Improvements in coating, coloring, and
 glazing or finishing laces, bands, straps, belts, and other
 similar articles, and in the machinery or apparatus employed
 therein." These articles (amongst them are mentioned
 boot laces "closely resembling leather laces") are made of
 plaited or twisted material; they are coated with a solution
 of starch, india-rubber, or gutta percha, and then glazed or
 finished by means of friction. The polishing may be effected
 by causing the article "to rub in contact with openings formed
 in a suitable frame or by passing it through dies, and in
 many other ways." The coating and polishing may "be
 effected by various arrangements of machinery or apparatus."

In the machinery which the patentee describes in his Spec-
 ification, the material is wound upon a drum which is supported
 upon a framing and obtains a degree of tension from a coun-
 terweight. The material is carried from the drum under a
 roller arranged in a trough which contains the solution; thence
 between a pair of rollers, round another drum, and "thence
 downwards where it is exposed to the action of a series of
 rubbing and polishing rollers." The material passes up
 from the polishing rollers "again over the drum and between
 guides to the cylinder on which it is finally wound;" if it is
 intended for boot laces, it is then cut into lengths and tagged
 in the ordinary manner.

The arrangement, gearing, &c. of the machinery are ex-
 plained at length.

[Printed, 10d. Drawing.]

A.D. 1861, February 6.—No. 306.

GEE, THOMAS.—"The production of a new composition or
 compositions, of which refuse leather is the chief ingredient,
 and manufacturing therefrom articles of utility, plain or

“ornamented.” The ingredients of this composition (from which the patentee makes boot, shoe, and clog soles and heels, and other articles of various sizes and shapes) are refuse leather of every kind, hemp, or flax, or other fibre, iron, or brass, or copper filings, and mucilage or gums or caoutchouc or gutta percha.

The leather is cleansed, cut up or pulped by machinery or otherwise, dried, and mixed with small quantities of fibre and filings. The mass is then mixed with mucilage or gum, &c., pressed or rolled into sheets, and cut up into suitable lengths and widths.

Soles and heels are put into moulds, and are perforated for the reception of nails, screws, &c.; some have imbedded in them metal tips; others are corrugated for wear in frosty weather; others have a pattern impressed on them.

[Printed, 4d. No Drawings.]

A.D. 1861, February 16.—No. 390.

WALKER, JAMES.—“Improvements in the manufacture of “soles for clogs and other coverings for the feet, and in the “machinery employed therein.” These soles are composed of equal quantities by weight of saw-dust, or shavings of wood or leather, or of hair or fibrous substances, or of a mixture thereof, and glue or gutta percha or other adhesive and water repellent material. The matters are mixed together and put in a plastic state into moulds.

The mould consists of two parts jointed together lengthwise of the sole, kept in position by pins or screws, and held together by a clamp or otherwise; it has a projecting rib all round of the shape of the groove “required in clog soles for the attachment of the top leathers.” The groove is not required for boot or shoe soles, or it may be “modified according to the “peculiar shape of the sole to be produced.”

To render the sole more durable, “iron heel pieces” and “steel or iron borings, turnings, or filings, or powdered emery,” may be put into the mould; these become embedded in or incorporated with the composition.

[Printed, 6d. Drawing.]

A.D. 1861, February 20.—No. 417.

WILKINS, EDWARD.—“Improvements in the manufacture of “boots, shoes, and goloshes, or other coverings for the feet,

"and in lasts or blocks for facilitating such manufacture." The vamp is cut down the middle "from the toe (or nearly so) to or above the instep." The parts are united by means of a strip of elastic or waterproof material or leather about an inch in width. The edges of the strip "lie in contact when there is no strain upon the elastic," and the vamp may have near each edge eyelet holes through which an elastic lace may be passed to prevent too great a strain upon the elastic strip. If desired a strip of metal (of rather less width than the elastic) may be inserted either above or below the elastic "for more perfectly excluding wet or damp"; it is attached to one edge only of the vamp, so as to be "capable of sliding or giving way to the expansion of the elastic." The vamp may be divided into more than two parts and be united in like manner with elastic strips.

The fronts of gaiters may be made in a similar manner.

"A good sole for ordinary wear" is made of the following combination of materials:—First an insole of leather; then "a horse-hair pad under the ball of the foot"; then a metal sole plate (as described in the Specification of Letters Patent granted to Mr. Wilkins on April 24th, 1860, No. 1019); then a layer of india-rubber, and lastly an outer sole of leather.

The last is made by cutting off from the bottom of an ordinary wooden last a piece of the whole width and length, and about half an inch in thickness. Openings are cut in the piece shaped "as a core for forming a mould, into which cast iron is to be run." The casting is fixed to the last, and the openings are filled with wood. On the upper side of some lasts there is inserted a strip of iron or steel extending from the toe to the top, "or in any other positions where any rivetting will be required."

[Printed 4d. No Drawings.]

A.D. 1861, February 25.—No. 483.

BIGELOW, LUCIUS AURELIUS.—(*A communication from George Chandler Prior.*)—"Improved machinery for making boots and shoes," that is, for sewing the soles of boots and shoes to their vamps or upper leathers. The bed plate supports "a projecting horn or arm together with a goose neck and the main shaft." The horn projects upward in an *inclined direction* from the neck and shaft; it contains in its

projecting end an instrument termed "a whirl," which receives the thread through a hole in its middle, and by its rotation winds it round the hooked needle "when this is in the central hole of the whirl"; when therefore the needle rises it carries with it "a loop of the thread." In the upper side of the horn is a thread channel "which passes through the horn near its upper end so as to come out on the lower side near the lower side of the whirl." In the lower side of the horn is a rotating shaft "sunken below the outline of the horn"; it carries at its upper end a pinion which fits the "gear formed on the whirl," and at its lower end a spur pinion "rotated by the reciprocating movement of a rack."

The needle bar is arranged to slide vertically in a rotating head (supported by the goose neck), "so that the axial lines of the needle and whirl may correspond." The rotating head contains the feeding mechanism, and that which moves at the proper times, and a slide, "whose function is to keep the previously formed loop from falling into the barb or hook of the needle while it is bringing another loop through that which was last formed." To keep the relative position of the thread hole in the whirl to the hook of the needle, the needle bar and the whirl are so connected, "that the rotation of the former will cause a corresponding angular movement of the latter, though leaving this latter free to rotate on its own axis for the purpose of throwing the thread into the hook of the needle."

By turning a hand wheel, "fixed in convenient proximity to the needle," the operator can rotate the head in any direction, "and with it the feeding instrument which always operates in a radial line to and from the axial line of the needle." The feeding instrument fits into a holder which slides in a piece pivoted or hinged near the top of the rotating head, "so that it may swing like a pendulum."

The machine is minutely described in the Specification. The sewing "known as chain or tambour stitch" forms a seam which may pass round the sole with "but one beginning and one ending if desired," and "the various curvatures of the varied forms of soles are equally and well provided for."

[Printed, 1s. 4d. Drawings.]

A.D. 1861, March 5.—No. 558.

CARTER, JOHN MONEY.—“Improvements in boots and other coverings for the feet.” These boots are intended more particularly for soldiers; they give greater pliancy to a thick or clumped sole when used in walking, “without materially affecting its rigidity for supporting the weight of the body when a rifleman or sportman is at the kneeling position.”

The outer sole is divided “at the point where the foot naturally bends”; the sections are united to the inner sole in the ordinary manner. The inner sole is left entire and is waterproofed with a thin coating of pitch or like substance. The outer sole, “from the root of the big toe to the point,” should be cut “in the direction of a line drawn through the points where the centre of the heel and the centre of the root of the big toe are respectively to rest.” The tongue should be blocked to the form of the instep, and in the same manner “as a Wellington front.” A gusset on each side of the tongue may be added to make the boot water-tight.

The boot is secured to the foot by means of a strap or straps “passed across the foot, either in the manner of sandal straps or otherwise through eyes, loops, or openings made in or attached to the front part of the boot;” the strap or straps may be fastened by a buckle. The boot best adapted for this part of the invention is a Blucher boot.

By using straps a little longer than actually necessary for securing the boots, the legs of the trousers can be raised to the height of the boots and be fastened round the legs.

[Printed, 8d. Drawing.]

A.D. 1861, March 11.—No. 599.

MYERS, ABRAHAM.—(*Provisional protection only.*)—“Improvements in the manufacture of boots, particularly adapted for ladies’ wear.” The appearance of these boots can be altered from light to dark to suit the weather or fancy of the wearer. The sides are made of two different colours, the one light, the other dark. “A wing or false half-upper” of two colours corresponding with the sides is fastened “to the front seam of the boot”; and the effect is produced “by throwing the wing or half-upper from one side to the other.” The

lower portion of the wing is secured near the sole by buttons, hooks, or other fastenings.

[Printed, 4d. No Drawings.]

A.D. 1861, March 11.—No. 602.

HUTCHINGS, JOHN THOMAS.—“Improvements in the manufacture of boots, shoes, and other coverings for the feet, and in tools for cutting the soles of such articles.” The patentee applies vulcanized india-rubber, or india-rubber compound soles, “preferring what is generally called india-rubber packing,” to boots and shoes of all kinds.

He saturates a woven fabric with india-rubber or gutta percha solution, dries it, and cuts it up into strips, “by preference transversely.” He sews the strips “in under the welt” so as to form “a waterproof foundation,” and a base for the attachment of the india-rubber sole. For light articles he makes the fabric serve as a welt. He coats the upper and the insole with solution, turns the strips over the welt, and cements on the outer sole. For strong goods he strengthens the waist “by applying gutta percha as a shank piece.”

In some goods he makes the outer sole “of a multicapsular form” to prevent the wearer from slipping; this sole may be made by moulding or punching. In others he inserts metal plugs into the soles; each plug is to be secured with two washers and to be riveted at the under side.

He fastens spikes into cricketers’ shoes by means of two plates, one on each side of the sole.

He makes the uppers of yachting and boating shoes of canvas or similar material and applies round them to some height from the sole “a waterproof protection.”

The knife which he uses in cutting-out the soles consists of “strips of saw or other thin steel connected by screws or otherwise to a block.”

[Printed, 4d. No Drawings.]

A.D. 1861, April 13.—No. 914.

ROBERTS, CHARLES.—“Improvements in boots and shoes and other similar coverings for the feet.” These articles are rendered more durable by the substitution of a metal welt for the ordinary leather welt. The welt is shaped “to fit

"accurately the contour of the heel and sole respectively; it is strengthened by being made "of an angular section somewhat similar to auger iron;" one flange, perforated to receive the fastenings of the heel or sole, is introduced between the inner and outer soles, the other fits against the outer edge of the heel or sole; its depth being regulated by the thickness of the sole and the height of the heel. The waist is not provided with a metal welt, "such welt being intended only for "the tread portion of the sole,"

[Printed, 6d. Drawing.]

A.D. 1861, May 6.—No. 1140.

ELLIS, GEORGE HENRY.—(*Provisional protection only.*)—

"Improvements in apparatus for cleaning boots and shoes, "which are also applicable for cleaning knives, forks, plate, "and other articles." Brushes of a cylindrical form are disposed upon a long spindle, about six inches apart; they are so fitted that they can be readily removed when required. Between any two brushes is mounted a dirt brush of similar form but of smaller diameter. The spindle is carried "in "bearing centres," and, "for the purpose of receiving the "spindle containing the brushes and the driving gear," a frame is employed, "presenting somewhat the appearance of "an ordinary table." The spindle is placed "immediately "under the front of the table top" and is driven by a band from a fly-wheel on a crank axle below "by means of two "cranks and treadles." The driving band "is deflected back- "wards over a stud pulley," thus conducting it out of the way of the operator, besides which the axle of the pulley "can "be disposed on a slide or otherwise rendered moveable and "weighted." A shelf and back piece are provided underneath the table top; these "cover the brushes except at the front" and prevent the dirt from being scattered about; sometimes "narrow slides" are fitted immediately over or under the brushes for the same purpose.

The blacking brush is disposed "on a separate axle and "suspended from a bar or joint immediately under the table "top in the same line or plane as the other brushes;" or it is placed between two arms "having elongated holes" for the axle to move in. Just behind the brush is a vessel for con-

taining liquid blacking; in it is a roller covered with felt or other absorbent. Outside this vessel, and on the same axle as the blacking roller, is a pulley so geared with the crank axle below that "the motion of the machine causes the blacking roller to rotate very slowly." The blacking brush is stationary until the article to be blacked is pressed against it. Sometimes a receiver is placed behind and under the blacking brush to receive any superfluous blacking cast from the brush.

The inventor mentions several modifications of parts of the apparatus.

[Printed, *4d.* No Drawings.]

A.D. 1861, May 8.—No. 1166.

HUNT, JOHN ROLFE.—"Improvements in the manufacture of gutta percha and compounds thereof with other matters and substances." Vulcanized india-rubber in a crushed or ground state is mixed with masticated gutta percha in a doughy state, in the proportion of 1 lb. of rubber to 2 lbs. of gutta percha. Arrowroot, in the proportion of about 4 ounces to every 3 lbs. of the mixture, may be added if desirable. The compound is worked up until it is in a fit state to be rolled into sheets.

A flexible substance is produced, "well adapted for the soles of boots and shoes" and other purposes for which vulcanized rubber and gutta percha are now employed separately.

It is preferred to use "new, fresh-made, and pure" vulcanized rubber, but sometimes such rubber is mixed with old and waste vulcanized rubber "freed as much as possible from any admixture of black lead, French chalk, or other deteriorating matters." The rubber is ground or crushed and then sprinkled with coal tar, naptha, or other suitable solvent; it is afterwards rubbed through iron sieves.

The addition of arrowroot "produces a superior compound material," much more flexible than gutta percha and resembling "the character and toughness of leather."

[Printed, *4d.* No Drawings.]

A.D. 1861, May 13.—No. 1215.

POLLARD, CHARLES FREDERICK.—(*Provisional protection only.*)—"A sandal slipper particularly adapted for use in

" Turkish and other baths." These slippers, being made of " materials which are non-conductors of heat," are intended to keep the feet cool while in the bath. The sole is of thin cork or other non-conducting substance and covered with sail cloth, canvas, or other suitable fabric. A flat band or strap sewn to each side of the sole allows the foot to pass under.

[Printed, 4d. No Drawings.]

A.D. 1861, May 28.—No. 1335.

BURNHAM, EGBERT REUBEN. — (*Provisional protection only.*)—"Improvements in the manufacture of boots, shoes, " and other coverings for the feet, made of india-rubber, gutta " percha, and like substances." The inner surfaces of the outer soles and the outer surfaces of the inner soles are during their manufacture embossed or corrugated or otherwise formed with lines or patterns. The object sought to be obtained is "to " prevent blisters or bubbles from arising on the sole during " the process of vulcanization;" the confined air will follow the corrugations or lines to the edges of the inner soles, " where it will escape without expanding and injuring the " outer soles."

The invention may be carried into effect "by machines or " apparatus constructed in many forms."

[Printed, 4d. No Drawings.]

A.D. 1861, June 4.—No. 1398.

STEVENSON, JOHN MACKENESS. — (*Provisional protection only.*)—"Improvements in the manufacture of boots and " shoes." A strip of leather is sewn to the upper side of the welt before the welt is fastened to the inner sole. When the outer sole is sewn to the welt, "the stitches are placed under- "neath the strip," and "very strong stitches can be used" instead of "fine stitches to please the eye." The sewing of the strip to the welt "will then appear as though it were "employed to attach the outer sole."

Pulp or half-stuff is spread over the inner sole for the purpose of "forming a waist and filling up between the inner and "outer soles;" when it is dry it is to be saturated with "a "solution of cobbler's wax," or a solution "made of similar "materials." Heels may be made in like manner.

[Printed, 4d. No Drawings.]

A.D. 1861, June 5.—No. 1412.

DODSWORTH, MARTIN and SMITH, WILLIAM. — (*Provisional protection only.*)—"An improved boot and shoe cleaning "machine." A framework of cast iron or wood has applied to it, "a single or double crank or treadle." The crank shaft drives "a semi-detached wheel consisting of three "segments," (more or less according to the size of the machine.) On the segments are screwed hard brushes on the left, blacking brushes on the right, and polishing brushes on the middle one. The crank shaft "runs on two dead "centres, with two regulating screws through the upright "standards which form a support for the table surrounding "the brushes on the back and on the sides, the front being "open." The back of the machine is "a wooden frame "which combines the two upright standards with the top "table." The treadle is hinged "on two centres with "regulating screws."

A separate machine supplies the brushes with liquid blacking by means of a roller covered with felt "and working on "centres supported on two upright standards from the side "of the trough containing the blacking." A supply of blacking "can be had at will" by means of a spring. The machine is fixed on the table at the back of the brushes "and "is self-feeding."

[Printed, 4d. No Drawings.]

A.D. 1861, June 6.—No. 1433.

GODFREY, BENJAMIN D.—"An improved boot or shoe with "leather 'uppers' and india-rubber soles." The last used for this boot has an iron or steel plate upon its sole. The upper and the insole being tacked together, an entire sole of india-rubber, or of some compound of which india-rubber is the basis, is then nailed on with brads having heads to hold the sole and ends clinched on the metal plate. The brads are to be close together (from $\frac{1}{4}$ to $\frac{1}{2}$ of an inch apart), and the joint may be rendered more water-tight if required by a layer of india-rubber cement. An outer sole of the same material as the middle sole is secured thereto by india-rubber cement, thereby hiding the heads of the brads.

The middle sole is vulcanized in a mould; it is made somewhat concave on its upper and convex on its under surface and with a thin edge all round. The outer sole is vulcanized in like manner; its upper surface corresponds with the lower surface of the middle sole; its lower surface is flat; and its edges are turned up so as to hide the edges of the middle sole and nearly touch the upper leather.

The heel may be of various materials and be fastened on in any convenient manner.

[Printed, *8d.* Drawing.]

A.D. 1861, June 28.—No. 1656.

MIDDLETON, SAMUEL and WRIGHT, JOHN. — (*Letters patent void for want of Final Specification.*)—"Improve-
ments in apparatus for the manufacture of boots and shoes." The inventors employ in the manufacture a metallic box (preferably of cast iron) of the shape of the foot, made in two halves which are hinged "and turn on a rod or bar," and fixed on a frame "capable of sliding towards a machine which
"screws the outer to the inner sole." The last with the upper thereon is put into the box; the box is tightly screwed up by any mechanical contrivance, and the inner sole and the upper are tacked together. The last is then taken out of the box; the outer sole is affixed with two or three pegs or tacks to keep it in position; the whole is put into the box; the box is again screwed up, thereby forcing the outer sole close to the inner; the box "is then turned at right angles to
"its former position, and brought in front of a machine by
"which the outer sole is screwed to the inner." The boot or shoe is then taken out and trimmed.

[Printed, *4d.* No Drawings.]

A.D. 1861, July 3.—No. 1689.

BENNIE, JAMES and MOFFAT, WILLIAM. — (*Provisional protection only.*)—"Improvements in the manufacture of
"heels, clog-irons, horseshoes, chain links, and similar
"articles, and in apparatus therefor." These articles are made entirely of steel or of iron afterwards case-hardened.

In order to make a heel, a rod of metal (by preference made red hot) is placed in the first shaping apparatus against

a stop, and a proper length is cut off by means of shears or other tool. The blank is now in position to be acted on "by a sliding shaper," whose front end is recessed and formed to the external shape of the heel. This slide bends the ends of the blank round a stationary block or die "shaped to form the under side and with its middle portion "projecting up and forming the inner edge of the heel;" it also forms the outer edge and top surface, having for that purpose flanges which hold the blank down on the block. The slide is fitted at its extreme points with rollers, which "coming against stationary inclined planes" cause the extreme ends of the blank to be bent slightly inwards; or the slide may be jointed so as to be turned inwards by the inclined planes.

Before the blank is removed from the block, nail holes are punched in it by means of a descending lever head fitted with punches, the slide and block "being both formed to admit "of this punching action." The punching being effected, the slide is moved back, and the heel is lifted off "by points "projected up through holes in the block." The heel is then placed upon "a convex bedding block" and is struck by a corresponding concave hammer head; or the block may be concave and the hammer head convex.

[Printed, 4d. No Drawings.]

A.D. 1861, July 15.—No. 1768.

WOYCCKE, THEODOR.—(*Provisional protection only.*)—"An "improvement in the manufacture, construction, and production of the heels and the uppers immediately above the "heels of boots and shoes for imparting durability and permanency of form to the said heels and uppers." The heel is rounded, and "to the under and external surface" is screwed "a moveable circular plate" of metal or other suitable material "cupped and sunk in the centre." The attaching screw is "recessed in the central portion of the plate" and works in a female screw sunk into the body of the heel. The plate covers the whole surface of the under external portion of the heel and can be turned round (when any part is worn away) by unscrewing the screw.

A band of metal or other suitable material is inserted "between the internal lining of the uppers immediately above

"the heels and the leather or other material constituting the exterior surface of the uppers;" this prevents any "lateral or oblique pressure by the foot" and keeps the heel and the upper immediately above the heel "in their true relative positions."

[Printed, 4d. No Drawings.]

A.D. 1861, July 20.—No. 1828.

GILBERT, MOSES.—(*Provisional protection only.*)—"Improvements in boots and shoes or other coverings for the feet." The inventor ventilates boots and shoes, &c. and gives ease in walking "by the application of elastic substances" to the soles and heels.

"Halves of hollow spheres" of india-rubber are secured to the soles and heels, and an aperture is made in the portion of the sole which is covered by each half sphere, so that "air is kept in circulation by the compression" of the half spheres. Or a small flat tube may be arranged within the sole "terminating in an aperture beneath the foot and in communication with the atmosphere by an opening in or near the heel."

[Printed, 4d. No Drawings.]

A.D. 1861, August 1.—No. 1913.

POWELL, ALEXANDER.—(*A communication from Charles Warren Bryant.*)—(*Provisional protection only.*)—"Improvements in the manufacture of boots, shoes, and other coverings for the feet." The object of this invention is to prevent "rupture at the seams and joinings of parts," such as "the junction of the vamps and quarters," by an arrangement "which is an ornament" to the boot or shoe.

For this purpose the inventor uses metallic rivets or studs clinched in such manner that "a considerable portion of the material" is clipped between the rivet ends. Ornamental washers may be used on one or both ends of the rivets.

[Printed, 4d. No Drawings.]

A.D. 1861, August 10.—No. 1993.

STOCKER, ALEXANDER SOUTHWOOD, and STOCKER, ALEXANDER RICHMOND.—"Improvements in the manufacture of horse shoes, boot heels, wheel tyres, rails, and safes."

These articles are made of bars and plates of metal prepared in the following manner:—"Puddled bars or plates of wrought iron" are put into a converting furnace and operated upon in the same manner as is generally practised when converting iron into steel." It is intended however to convert them only partially, "so as to leave the inner part of the metal in its fibrous condition whilst the outer surface or surfaces are hardened to a greater or less depth, and on one or more of its surfaces, as circumstances may require." The bars or plates are formed into a pile "of suitable length, breadth, and thickness." The pile is heated to a welding temperature and is passed through a rolling mill, whereby the whole becomes thoroughly incorporated, welded into one solid mass, and rolled out to dimensions requisite for the purpose intended.

Boot heels are produced by stamping the prepared metal by the aid of dies and tools fixed in a stamp or fly press or in any other convenient manner;" they are constructed so that they may be readily affixed to and detached from the boot."

[Printed, 4d. No Drawings.]

A.D. 1861, August 19.—No. 2058.

SMITH, WILLIAM HENRY.—"Improvements in the preparation, application, and manufacture of peat." The first part of this invention relates to the preparation of peat which the patentee terms "vulcanization;" this he effects "by the heating, boiling, and roasting of peat, either alone or in combination with various acids, alkalies, salts, resinous, calcareous, and other mineral substances."

Another part relates to the application of vulcanized peat to various uses, among which are mentioned "peat black, peat leather, blacking." Peat black is made "by roasting peat in shallow vessels and grinding or reducing it to a powder or a liquid, either alone or in combination with soda or sulphate of iron;" this preparation is used "as a basis for liquid and paste blacking."

[Printed, 4d. No Drawings.]

A.D. 1861, August 31.—No. 2173.

SOUTHWOOD, WILLIAM.—(*Provisional protection only.*)—"An improved method of making boots, and shoes, or of parts

"thereof." The improvement consists in riveting or "leaving" the inside points or ends of the nails, pegs, or screws" when the boots or shoes are finished "between the leather or material of or forming the inner soles of boots and shoes" when an inner sole and more than one is used;" and when only one is used, leaving the inside points "between the leather or material."

The edge of the inner sole is cut "about three-eighths or half-an-inch deep inwards on the flat part or side of the leather," sufficiently deep to allow of the pegging, nailing, &c. A groove is cut out in the last round and near the outer edge to enable the workman "to turn into it" the cut portion of the inner sole. When metal pegs are used, the outer edge of the last should be of metal; when wooden pegs are used, "this is not absolutely necessary." When the inner points are driven through the leather, they "will turn or rivet against the outer edge of the last," if the pegs are of metal; if the pegs are of wood, the ends will be "between the material or leather of the inner sole when the boot or shoe is finished" and the part previously turned into the last returned to its "original form or place."

A thin piece of metal may be placed "between the leather or material when cut;" in this case "the groove in the last is not necessary."

[Printed, 4d. No Drawings.]

A.D. 1861, August 31.—No. 2182.

CURTIS, FREDERICK.—(*Provisional protection only.*)—"Improvements in forming or shaping the tops or upper parts of boots from woollen or mixed fabrics." These uppers consist mainly of two pieces (back and front) "cut to a pattern for each." One piece at a time is folded down the middle, damped, placed upon a block, and pressed with a hot iron from the edges to the fold "whilst the material is pulled into form." The processes are repeated, "the iron being worked from the plain parts gradually towards and over the creases until they are removed." The pieces should be turned over several times, and each side be operated upon alternately. The front and back are fastened at the waist by two short seams and "form (with the lining and elastic) a boot top seamless both back and front."

[Printed, 4d. No Drawings.]

A.D. 1861, September 9.—No. 2254.

NEWTON, WILLIAM EDWARD.—(*A communication from Joseph Lacy Joyce and Edward Heaton.*)—"An improvement in the construction of boots and shoes." The inventors dispense with "a great portion of the outsole" and "all the shank leather," thereby giving greater ease to the foot in walking, relieving the upper leather of much of the strain to which it is ordinarily subjected, and facilitating the making and repairing of boots and shoes.

The shank or waist piece is of metal "curved to correspond with the arch of the foot and the desired width" of the boot or shoe between the heel and the back end of the outer sole. The back end of the shank is inserted into the upper part of the heel and under the back end of the outer sole; it is fastened on with nails which are clinched inside the boot or shoe. The shank does not require any covering of leather; the back end of the outer sole (or rather half sole) is nailed to it; the front part of the sole and the heel are fastened on in the usual manner.

[Printed, 6d. Drawing.]

A.D. 1861, September 16.—No. 2300.

HORSLEY, SAMUEL, and JONES, EDWARD HOBSON.—"Improvements in apparatus for cleaning and polishing boots, shoes, and other coverings for the feet, partly applicable for cleaning plate and other articles for domestic use." In this apparatus circular brushes revolve by means of a treadle or other contrivance. The brushes when placed in position form "one continuous brush, the periphery of which will be alternately concave and convex." The blacking is supplied by "discs, arms, or vanes fastened to a spindle resting on a frame placed in the receptacle or trough for containing the said blacking." The discs are brought into contact with the blacking brush at will "to communicate the required quantity and no more."

The apparatus is described as composed of (1) a framework held together by bolts or strengthening stays; (2) a driving wheel, crank axle, treadle, driving band, and driving pulley on the spindle which carries (3) the brushes, namely a hard brush, a blacking brush, and a polishing brush; (4) a board or plate

passing from one side of the framework to the other and having fitted to it (5) a trough which contains the blacking and the apparatus for supplying the blacking to the brush; (6) a guard "to prevent any of the cleaning substance from being thrown off."

The spindle for convenience of removal "is set up by centre screws and binding nuts," although in some cases bearings on the framework may be used. The apparatus for supplying blacking to the brush consists of discs mounted on a cranked spindle which is actuated by a handle; this arrangement admits of modifications which are explained in the Specification.

The method of working the apparatus is described by the patentees.

[Printed, 8d. Drawing.]

A.D. 1861, October 1.—No. 2443.

KNIGHT, JOHN ADAMS.—(*A communication from Henry Port.*)—(*Provisional protection only.*)—"Improvements in the manufacture of boots and shoes." The insole is made either of leather or of "thin metal of a skeleton shape in conformity with the outline of the sole and with a cross piece at the middle for the reception of the rivets that secure the half sole in the shank." The sole (or half sole) is "cut and punched at a single operation with a knife and punches that are worked by a press." The shank and heel portion may be made of leather, but the inventor prefers to mould it of india-rubber or other plastic material and with recesses for the reception of pieces of cork "to make it less heavy than if it were solid." The shank is formed with "a double tongue for the reception of the back end of the front or half sole." The rivets used for fastening the parts together are staple-shaped and flat pointed; they are "alternately clinched in opposite directions;" some may be "incorporated in the shank." The bottom of the last is faced with metal round the edges and across the middle; it is made with "suitably inclined grooves" for receiving the points of the rivets and clinching them as before said.

In the manufacture the shank when placed in position "is forced down with a die which causes the rivets to pass

" through the edges of the upper and the holes in the insole."
The outer half sole is riveted to the edges of the insole and
" across the middle and between the tongues of the shank."

[Printed, 4d. No Drawings.]

A.D. 1861, October 1.—No. 2447.

SCOTT, JOHN WILLIAM.—"Improvements in tools for the
" manufacture of leather and other rings, washers, and laces."
The tool for cutting laces consists of "a cutting blade fixed or
" bedded spirally in any suitable bed or holder;" the spaces
between the coils of the spiral determine the width, and the
number of coils the length of the lace. A space is left in the
centre or at the outer end of the tool for the formation of "a
" head or solid piece at one end of the lace to take the place of
" and prevent the necessity of making a knot." Sometimes
the tool is formed with spaces to cut a head at each end, so
that by dividing the lace in the middle, two laces are produced,
each having a head at one end. The lace is removed from the
tool either by means of "a spiral moveable piston" connected
with the tool or by hand.

[Printed, 6d. Drawing.]

A.D. 1861, October 3.—No. 2470.

EVANS, THOMAS.—"Improvements in the manufacture of
" boots, shoes, and other coverings for the feet, and in the
" machinery, apparatus, and means connected with such
" manufacture." This invention is intended "to facilitate
" the operation of lasting and fastening on the sole" as well
as of "crimping or piping the upper."

The machinery is composed principally of (1) a base or sole
plate; (2) two pillars supporting a cross-head whereon rests
the toe part of the last; (3) a pillar supporting the other end
of the last and standing on a sliding frame; (4) guides at each
side of the frame whereon the frame moves to and fro by means
of a screw; (5) a horizontal spindle carrying two "ratchet
" wheel flanged reels" (round which looped straps pass) and a
notched clutch which (being moved by a forked lever handle)
tightens or slackens either reel as required; (6) pawls to
" prevent the reels turning round the wrong way;" (7) a "toe
" clip arrangement" consisting of two moveable clips or

nippers actuated by a cam; a bottom plate slotted in the middle for the passage of a pin which secures the cam in position; guide flanges; a slide "which covers the cam and clips and causes the clips "to open wide or close up together."

The cross-head is moved by a spring handle and is held in position when at work by a pin which takes into a quadrant rack; it has also "a spring bar" which the patentee calls "the drafting bar;" this is kept in position (when clipping the toe part) "by a catch at the free end." The toe clip arrangement is hung upon an arm projecting from one of the pillars, "so that by unlatching it may be swung out at right angles or still further to enable the cross-head to be got at "and take the boot or shoe out."

When the last with the upper and the insole thereon is placed on the pillars and crosshead, &c., the slide pillar is drawn back "till the leather is sufficiently drafted." The looped straps are now passed over the last and tightened, and the upper "is drawn tight and secured" by the aid of pincers. Then "the toe leather" "is let loose for the purpose of crimping or piping the toe," which is done "by inserting a cord "or wire round the edge of the upper at the toe and heel;" or the cord or wire "may be dispensed with and the toe clips "applied." The outer sole is put on the last "ready "pierced;" it is blocked by means of the straps, and the pegging or sewing is performed in the ordinary manner.

For lasting the heel the patentee prefers to have two pillars without the crosshead, but with the toe clip arrangement (the clips being changed in curve to suit the shape of the heel), one on each side of the slide pillar.

[Printed, 10d. Drawing.]

A.D. 1861, October 22.—No. 2639.

MAY, HENRY.—"Improvements in goloshes." The front and sides are made "somewhat of the ordinary form of leather "goloshes." The back part rises up at the back of the heel and ankle to a point, "two, three, or more inches above the ankle"; it is fastened round the ankle (instead of round the instep) by a strap or other fastening.

Sometimes the back part is made of considerable depth so as to form a legging and enclose a greater or less length of the leg; this part is fastened by buttons or otherwise.

[Printed, 6d. Drawing.]

A.D. 1861, October 23.—No. 2642.

ARCHER, GEORGE.—“Improvements in sewing boots and “ shoes.” The boot or shoe being lasted in the usual manner, the welt is tacked on all round and “upright holes” are pierced through the welt, the upper, and the insole. The last is then taken out, the insole is turned back “to the toe of “ the boot or shoe,” and the sewing is began “at the middle “ of the toe.” Two threads are used, one for each side, and worked alternately until the heel is reached; the last is then put in again, the seat is sewn and the boot or shoe is finished in the usual way.

Sometimes instead of lasting previous to sewing, the insole is shaped for the last and pierced for sewing “by making up- “ right holes straight through.” The upper, having the top “marked or printed to be holed,” is then lasted and after- “wards taken off to be holed.” The welt is then pierced, and “the sewing effected as first described.”

Sometimes the insole is cut “down the middle so as to begin “to sew at the waist.”

In all cases “the sewing is upright, straight through the “welt, the upper and the inner sole,” or nearly so. This method of sewing “permits the stitches to be examined on the “inside of the boot or shoe, and the quality to be readily “inspected.

[Printed, &c. Drawing.]

A.D. 1861, November 1.—No. 2737.

LANG, DAVID.—(*A communication from Germain Burnet.*) —(*Provisional protection only.*)—“Improved moulded india- “rubber boots, shoes, and other like articles.” These articles have “a solid sole and heel, vamp, back, and leg, formed “without any seam or foundation, every part being solid and “the whole in one piece when finished.”

The inventor designs a model of the shape, &c. of the foot, and then makes a mould corresponding with the external form of the boot or shoe when moulded and finished upon the model. The space between the external surface of the model or core and the internal surface of the mould corresponds exactly “with the dimensions and thickness of the elastic material at “every part” of the boot or shoe.

The inventor proposes to use india-rubber "of various degrees of hardness, chemically combined in the mould and cured in the usual way." The sole and heel may be formed in layers; the upper may be in sheets cut and stretched upon the core; the whole when in the mould "receives its form by heat" and when cool is ready for wear.

[Printed, 4d. No Drawings.]

A.D. 1861, November 5.—No. 2779.

BOWRA, EDWARD.—"Improvements in the manufacture of elastic fabrics." The patentee applies his elastic fabrics to springs of boots, shoes, belts, braces, doors, and windows," also to the manufacture of "superior floorcloth."

The following is the process described:—50 lbs. of "clean masticated" india-rubber, gutta percha, or other elastic gums, 25 oz. of chloride of sulphur, and 25 oz. of dry hypochlorate of lime are well worked together at a temperature of 60° Fahr. The mass is rolled into sheets with cold rollers and is afterwards elongated "into a suitable form or pattern." Sheets of cloth or other fabric "in transverse forms or otherwise" are caused to adhere to the sheets of the compound, and the whole is "perfectly, equally, and permanently vulcanized" by being placed in "a heated chamber or steam chest at 100° Fahr. for two hours."

The patentee describes his method of preparing and vulcanizing "thick and heavy articles."

To ventilate the fabrics he perforates and corrugates them "by means of curing cloths either in metal or woven fabrics or other suitable materials, such cloths having pins, needles, or sharp-pointed metal placed on or in them at required distances." He rolls them or confines them in the curing cloths and submits them to the heat before-mentioned.

[Printed, 4d. No Drawings.]

A.D. 1861, November 6.—No. 2786.

BRADT, HERMAN D.—(*A communication from John Taggart*).—"Improvements in machinery for lasting and pegging shoes." The improvements consist in (1) the combination of lasting and pegging mechanism; (2) the combination of "a back latching mechanism and its unlatching mechanism"

with the hammer and the peg driver; (3) a "peculiar screw or worm" by which the movements and intervals of rest of the vertical shaft of the lasting mechanism carriage are produced; (4) a "self-adjusting presser" by which the carriage of the lasting mechanism is kept in gear with its driving pinion; (5) a lasting mechanism adjustable carriage; (6) a lasting block composed of "a bed block, heel, and toe, and lateral or side clamps or crimpers"; (7) mechanism for actuating the heel and toe crimpers; (8) the combination of an adjustable toe rest with the lasting block.

The driving shaft is horizontal and carries "a double cam" on its rear end. The cam acts against the foot of a pitman which is suspended from the tail end of a hammer. The hammer "turns vertically upon a fulcrum," and a spiral spring causes its downward motion upon a peg driver. This driver "plays vertically within a rocker" at one end of a peg-wood carrier. The carrier is supported on an arm whose outer end is borne by a pillar, and a spiral spring applied to the arm and pillar moves the carrier forward and keeps it in contact with a lasting block, whilst a roller keeps the carrier in position with reference to the block. The carrier is provided with a slider which is drawn towards the peg driver by a spiral spring. The driver carries an awl, so that piercing and pegging go on at the same time. The driver and carrier "may also be furnished with a suitable device" for separating a peg from a strip of wood.

To avoid the effects of the "rebounding of the hammer" a back latching mechanism is introduced; it consists of a latch "extended from the peg driver" and a spring catch "projected upward" from the carrier and under the latch. The unlatching mechanism consists mainly of a lever and a "lifting cord" attached thereto and to the hammer.

The lasting block is formed with a mould for the reception of the last and the upper; it has "two heel and toe clamps" and two "side clamps or crimpers;" the mechanism for actuating the clamps is explained in the Specification. Inside the block is an adjustable toe rest, which serves "to extend underneath and support the toe part of the last." The block rests on a carriage "provided with a tooth internal rack" which engages with a pinion on the upper end of an upright shaft. The presser which keeps the rack engaged with the pinion is

composed of a spring, a lever whose fulcrum is supported by the spring, and two vertical rollers supported by the lever and resting against the carriage.

On the lower end of the upright shaft there is "a worm gear" which engages with a screw or worm fixed upon the driving shaft. Each thread of this worm "instead of being a true helix runs perpendicular to the shaft for short distances on two opposite sides of it so as to produce during opposite quarters or arcs of each revolution of the worm no rotary movement of the worm gear." In consequence of this arrangement the lasting block "will be fed forward with an intermittent motion such as will be necessary to enable the pegs to be inserted in the shoe."

The action of the machinery and a modification of certain portions are described in the Specification.

[Printed, 1s. 2d. Drawings.]

A.D. 1861, November 16.—No. 2881.

GRINT, JAMES.—(*Provisional protection only.*)—"Improve-ments in pegs, nails, or like fastenings, for uniting the soles of boots and shoes and other substances." These fastenings are made of wood, bone, metal, or other suitable material; they have a sharp point, a flat head (enlarged from the body "in regular tapered or curved lines,") and they are barbed near the point; they may also be "split up and have a constant tendency to open," whereby they will hold more securely.

Some fastenings are made pointed and barbed at both ends; these are partially driven into one substance; the other substance is then laid on, and "the entering and driving of both ends takes place simultaneously."

The inventor prefers to punch metal fastenings from a sheet of metal, "in which case they are square or rectangular in cross section."

[Printed, 4d. No Drawings.]

A.D. 1861, November 19.—No. 2907.

GODFREY, BENJAMIN DAVENPORT.—"An improved boot or shoe with a wooden shank-part and a flexible fore-part to the sole." The insole is attached to the upper in the

usual manner. A sole of india-rubber “which extends back a little beyond the ball of the foot” is then fastened on by rivets or otherwise, and to this is cemented an outer sole of vulcanized rubber, “the rear end of which is chamfered off.” The shank (of stained or blacked wood) is bevelled off in front; it is screwed or nailed to the insole and to the rear end of the outer sole.

The shank and heel may be made in one piece, or the heel may have lifts of rubber or leather secured to the wooden portion. The outer sole may be of leather and be attached to the insole without the use of an intermediate sole.

[Printed, 6d. Drawing.]

A.D. 1861, November 22.—No. 2934.

FARMER, GEORGE JAMES.—(*Provisional protection only.*)—“Improvements in machinery or apparatus for polishing shoe heels, toe plates, and other articles.” A “polishing bob or wheel” is mounted in adjustable bearings at the upper part of a frame; the surface of the bob is dressed or prepared with “glue and emery or other materials of cutting quality.” The bob is caused to rotate at a high velocity in any convenient manner. Below the bob an endless band travels slowly round pulleys which are supported in adjustable bearings carried by the frame. The articles to be polished are held on the band whilst passing under the bob by pieces of metal fastened to the band; they may be attached to the band in any other suitable manner. Pressure may be applied to the articles by means of adjusting screws.

The arrangement of the parts and the mode of carrying the articles may be varied.

[Printed, 4d. No Drawings.]

A.D. 1861, December 6.—No. 3061.

COLLIER, EDWIN.—(*Provisional protection only.*)—“Improvements in coverings for the feet and legs.” This invention relates to a boot “intended to be worn as a shooting, riding, or ordinary Wellington walking boot;” it is however more particularly adapted for military wear. The gaiter or leg portion is made “without any opening at the side or front,” but is provided with “buttons, imitation button holes, and buckle and strap,” so that when the boot is worn

outside the trouser "it presents the appearance of a gaiter and boot." For military purposes the leg should be cut as long as the military gaiter now in use.

[Printed, 4d. No Drawings.]

A.D. 1861, December 13.—No. 3134.

CABOURG, THOMAS.—(*Provisional protection not allowed.*)—

"Improvements in screwing leather for the manufacture of shoes and for other purposes." The inventor constructs a machine, which will form a thread upon a continuous length of wire, screw a portion of the threaded wire into leather "without the necessity of having any hole made," and cut off the portion which has been screwed in.

The wire to be threaded is wound round a large grooved pulley; when uncoiled it passes through a hollow axle, "which gives it a motion of rotation in a plane perpendicular to the direction of its course;" hence "it has imparted to it a progressive spiral motion and in this way enters the tapping plate." It then passes through a guide, enters the materials to be united, and after penetrating to a sufficient depth is cut by a pair of knives so disposed as to give it an oblique cut. This cut forms "a sharp point upon the succeeding part of the wire, which enables it to enter more easily the material when in its turn it is brought into position." The knives are brought into action by levers and a treadle or by other means. The machine is placed upon a frame and is worked by hand or other power.

[Printed, 4d. No Drawings.]

A.D. 1861, December 20.—No. 3202.

BOUSFIELD, GEORGE TOMLINSON.—(*A communication from Simon Smith Bucklin.*)—"Improvements in machinery for

"attaching the soles of boots and shoes to the upper leathers." This machine when placed upon the edge of the outer sole will, on being struck with a hammer, "make a hole for the reception of a peg, drive a peg through the sole and upper leather, move itself along so as to be in position for a repetition of the operation, and feed up the peg wood so as to bring another peg into the proper position to be split off and driven."

The hand of the workman grasps "the body of the instrument." A trough for containing pegs is screwed or otherwise fastened to the body. The pegs are thrown forward by a follower and a spiral spring, and the follower is drawn back by a cord for the purpose of inserting a fresh strip of pegs, the strip being introduced through an opening in the top of the trough. The pegs pass in "beneath the peg driver" and "beyond the knife." The awl and the peg driver (placed contiguous to each other) are secured to the lower end of a plunger, which works within the body and is forced upward by a coiled spring (until checked by a pin) and is prevented from turning by a feather. An india-rubber spring "brings up upon" the cap plate and serves to withdraw the awl from the "leather;" it is assisted by the coiled spring, "which then" "raises the plunger" and holds it in position until it is again depressed. A cushion of leather receives the blow of the hammer. A "moveable centre or feeding instrument" consists of a point on the end of a bent finger which is screwed into a short block. The longer portion of the finger is surrounded by a spiral spring that serves to hold the point in position. This instrument is secured to the lower end of the body by a shoulder, a recess, and a pin. An adjustable gauge rests against the edge of the sole and determines the distance from the edge at which the pegs are put in.

If the boot or shoe is to be pegged partly with wood and partly with nails, the holes for the nails may be made without driving the wooden pegs into them by pressing upon a button on the end of a stop, "which thus holds the strip of pegs and" "prevents it from feeding."

A full explanation of "the operation" of the machine and of modifications "in the construction and operation of the" "feeding point and the parts immediately connected there" "with" will be found in the Specification.

[Printed, 2s. 6d. Drawings.]

1862.

A.D. 1862, January 1.—No. 2.

SZERELMEY, NICHOLAS CHARLES.—"Improvements in the" "manufacture of leather cloth or imitation leather, and in

"rendering certain fabrics waterproof." This imitation leather called by the patentee "panonia leather" is waterproof but "not impervious to air;" it can be made to resemble calf skin and cow leather, can be blacked and polished with common blacking, and is particularly suitable for the uppers of boots and shoes. It is made from linen, woollen, and cotton fabrics saturated and coated with the following compositions :—

No. 1 is composed of 224 gallons of infusion of oak bark, 30 lbs. of alum, 40 lbs. of gelatine, 30 lbs. of stearic acid, 10 gallons of resin oil, 10 lbs. of zopissa, and 40 gallons of linseed oil. Boil the alum in the infusion; add the gelatine, and boil again. Dissolve the stearic acid in the resin oil. To dissolve the zopissa, heat the linseed oil until "it ignites spontaneously;" after burning for a short time extinguish the flame "by a close-fitting cover to the vessel in which it is heated;" remove the vessel from the fire; allow the oil to cool for about a quarter of an hour; replace the vessel on the fire; heat the oil until it burns again; extinguish the flame as before; add the zopissa, and heat the whole until the zopissa is completely dissolved. Mix all the ingredients together.

No. 2 is composed of 240 gallons of linseed oil, 20 lbs. of zopissa, 200 lbs. of resin, and 100 lbs. of resin lampblack. Dissolve the zopissa in the oil as before described; add the resin, and heat until it is dissolved; when the mixture is cooled, add the lampblack.

No. 3 is composed of 20 lbs. of zopissa, 240 gallons of linseed oil, and 6 lbs. of solution of tin. Add the solution of tin to the zopissa dissolved in the oil as before, when the mixture is partially cooled. The addition of about 40 lbs. of Prussian blue "brightens and improves the colour."

Saturate the fabric with No. 1, and dry it in the air. When dry, saturate and coat it with No. 2, drying it in the air between each saturation and coating.

For an imitation of enamelled leather, coat the fabric afterwards once or twice with No. 3, and dry it in a stove.

For an imitation of Morocco leather, coat it instead with a solution of zopissa in linseed oil as before described in the proportion of about 20 lbs. of zopissa to 240 gallons of oil, to which the required colouring matter (previously ground) has been added. The graining can be produced in any "known way."

In all cases the linseed oil must be purified.

[Printed, 4d. No Drawings.]

A.D. 1862, January 14.—No. 103.

PAINE, JAMES.—(*Provisional protection not allowed.*)—
“Improvements in printing and ornamenting kamptulicon
“when applied to fabrics.” It is proposed to print and
ornament kamptulicon, “after it has been allied to a fabric,”
with colours either waterproof or non-waterproof, so as
thereby to produce a material “suitable for floorcloths, table
“covers, shoe stuffs, wearing apparel, and other similar
“purposes.”

[Printed, 4d. No Drawings.]

A.D. 1862, January 20.—No. 148.

AGNEW, JOHN WASHINGTON.—(*A communication from Samuel Slater.*)—(*Provisional protection only.*)—“A new
“or improved kind of last capable of being adjusted to various
“sizes and to various shapes of toes,” thereby saving the
necessity “for having such a great number of different lasts as
“are now required.” The inventor affixes to lasts of the
usual or other form toe plates or thin sheets of metal of about
one-eighth of an inch in thickness, and three inches in length.
The plate is fastened to the last by a screw working through
a slot in the plate into a metal nut let into the toe of the last.
The plates are made “round, square, pointed, or otherwise,
“so as to suit the fashion or shape required.” Each plate
is made capable of extending the last to “four different
“sizes.”

[Printed, 4d. No Drawings.]

A.D. 1862, January 21.—No. 162.

TOZER, WILLIAM, and READ, ARCHIBALD.—“Improvements
“in boots and shoes.” The articles especially affected by
this invention are known as “cork clump boots and shoes,”
and the improvement consists in the mode of enclosing the
cork sole.

A cavity for the reception of the cork sole is formed by sew-
ing or otherwise attaching to the welt “a box or raised edging
“of leather of sufficient thickness and strength to admit of
“the outer sole” being secured thereto by any of the ordinary
means.

In like manner the heel is formed of cork "enclosed within
"a raised edge or cavity to which the top pieces are fixed."

Instead of cork other light waterproof materials may be
used.

[Printed, 10d. Drawing.]

A.D. 1862, January 23.—No. 169.

HINKS, JOSEPH, and DIXON, ADAM.—(*Provisional protection only.*)—"Apparatus for warming and drying boots, shoes,
"or slippers, which apparatus is also applicable for racking or
"storing boots, shoes, or slippers for exhibition or otherwise."
The inventors make a stand or frame of wood, metal, or other
material, so constructed that the articles resting upon the body
thereof "shall expose their uppers or soles at a proper angle
"to the action of the fire." The articles are held on the
frame by means of "a bow, rod, tube, or wire attached to the
"frame," but at such a distance above the body of it as to
permit the foot part of the articles to pass between the bow
and the body. The bow may be fitted with spiral or other
springs so as to expand or contract for different sizes.

[Printed, 4d. No Drawings.]

A.D. 1862, January 24.—No. 189.

HALL, CHARLES GODFREY.—"Improvements in the manu-
"facture of boots, shoes, and leggings." These articles
"will permit the free escape of perspiration," and "will
"retain their proper shape and position while in use."

The patentee uses for "the legs of long boots," for "the
"upper parts or tops of short boots and shoes," and for
leggings, "horsehair, goat's hair, human or other suitable
"hair, with which may be mixed silk, wool, cotton, flax, or
"other suitable animal or vegetable, textile, or fibrous
"material, or any fibre which will act as a substitute for
"hair."

Combinations of these materials are woven or plaited
together into a fabric of the required strength and thickness;
sometimes they are woven or plaited "directly into any
"required form or shape;" by this latter process it is pro-
posed to make "the stocking-like shapes for boots or for
"coverings for the foot and leg."

[Printed, 4d. No Drawings.]

A.D. 1862, January 30.—No. 251.

MALOIS, ALEXANDRE CÉSAR BARNABÉ.—(*Provisional protection only.*)—"Improvements in the manufacture of boot " and shoe heels and in machinery to be used therein." These heels are formed outwardly of one piece of leather. The machine employed forces the edges of the leather "to fold " over on themselves so as to form the shell or frame of the " heel which is afterwards filled-up with discs of leather."

A lever press is fixed on a frame. On the frame immediately under the screw of the press is secured a matrix of cast iron. The end of the lever acts on a circular plate furnished with " three punches arranged in the form of a triangle."

The leather suitably shaped is laid on the matrix, and the first punch being brought down forms by its pressure the hollow of the heel. This punch is raised, "a glutinous " matter" is put into the hollow of the heel, and the second punch effects "the fixing of the disc of leather in place." The second punch being raised, the edges of the shell (which have glutinous matter applied to them) are folded inwards and pressed down by hand, and the third punch being brought into operation "at the same time closes the heel, affixes a " mark upon it which it bears in relief, and also gives it the " form desired;" the heel is now ready for use.

[Printed, 4d. No Drawings.]

A.D. 1862, February 24.—No. 489.

WALLER, RICHARD.—"Improvements in machinery and " apparatus for joining leather and flexible and textile " materials, and for the manufacture of boots and shoes and " other coverings for the feet." This invention relates to improvements on the one for which Letters Patent were granted to Mr. Waller, dated March 14th, 1859, No. 640. The Specification extends over 51 pages, and as the patentee does not claim "the several and distinct parts of the machinery" described and does not confine himself "to the precise details" set forth, laying claim only to "the several arrangements and " combinations of mechanism" mentioned or "any mere " modifications or equivalents" thereof, it will be sufficient to state what operations are to be performed, referring the reader to the Specification for particulars.

1. "Finishing the soles and heels before they are fixed to the uppers":—If when the hides of leather are cut into strips "the lengths of the strips are inconveniently short," they are pieced together with cement and pressed or riveted together, so that they may be wound round cylinders and "be freely delivered to the machinery for the purpose of being rapidly cut for the formation of the heels." The heel pieces are cut into lifts by heel punches, and when the heels are "built," they are shaped by a revolving cutter and are afterwards put into a mould with polished sides and pressed. The soles are cut as nearly as possible to the shape and size required; they are then damped, blacked on the edges, and pressed in dies which have polished sides (for finishing the edges) and rims to prevent the leather from spreading. In order that the soles may "fit exactly to their position" on the uppers and insoles, "two small pegs or pins of metal are screwed into the blade or prick which cuts the sole," the one at the waist, the other near the toe. The moulds are so constructed that heat can be applied to them. Various methods of polishing the edges of the soles are described as well as the various arrangements of machinery required.

2. "Riveting and screwing the soles and heels to the uppers":—Wires are arranged so as to be cut into suitable lengths, "the wedge or taper-shaped rivet either round or square" being preferred. The rivets are cut "in continuous lengths, namely, the head of one attached to the point of the other;" they are put into "a frame which keeps them straight," their ends "are put into guides," and a groove in the frame admits "of means of pushing the rivets forward to be cut." "Many arrangements may be devised for means by which the rivets after being cut are to be conveyed to the soles" and put into them; these arrangements are fully explained. If screws are used, the wire has a screwed thread upon it; the heads "are cut across," and screw-drivers "actuated by machinery" accomplish what is otherwise done by hand.

3. Apparatus for placing the uppers on to the lasts:—A socket fixed on a bed receives other sockets suitable to the shanks of different sized lasts. Two grooved uprights "rise at right angles to the direction of the lasting frame" and are made "to move frames up and down" them. One part of the

lasting frame is sufficiently above the last to allow the workman to work without impediment, the other part is below the last. The last with the upper thereon is put into a clamp, the sides of which "half way down are jointed and about three pieces " to each side." The insole is put on and "the clamp pieces " are closed up." Gussets or angular pieces are cut from the upper so that the edges may lie as flat as possible on the insole, and the stretching is performed by "box-headed " pliers" actuated by mechanism. An "upper frame" laps down the edges of the upper.

4. "An eyeletting machine :"—In one arrangement punches and dies and cutters are employed; they are actuated by springs and cams. Holes are punched out of the upper; pieces for eyelets are cut off from tubes; the pieces are conveyed into the holes and are clinched on both sides. In another arrangement the eyelets are formed out of flat pieces, put into a hopper, and made to fall into dies.

[Printed, 2s. 6d. No Drawings.]

A.D. 1862, February 27.—No. 540.

SEAGER, ROBERT.—(*Provisional protection only.*)—"Improvements in the manufacture of boots and shoes, and in " apparatus employed therein." The sole or sole with a heel thereon is pressed into shape in a mould. If only one piece of leather is used, it is moistened, put into a mould, and subjected to considerable pressure; if several pieces are used, they should be cemented together with a waterproof cement before they are cut into shape and moulded. Gutta percha and other soles (with or without heels) are made in like manner, but an inner surface or lining or an outer surface of leather or other substance should be applied thereto to prevent any spreading when worn. These soles are fixed to the uppers by sewing, or by brads, screws, or otherwise; the brads are (by preference) made with bevelled points and bevelled heads.

[Printed, 4d. No Drawings.]

A.D. 1862, February 28.—No. 549.

POLLOCK, JOHN.—(*Provisional protection only.*)—"Improvements in apparatus for protecting trousers from mud," A shield is attached "to the hind portion of the heel of a boot

"or shoe," so that the mud is caught by the under side of the shield instead of being thrown on to the legs of the trousers.

[Printed, 4d. No Drawings.]

A.D. 1862, March 1.—No. 558.

BOYER, PIERRE HENRI.—(*Provisional protection only*).—"Improvements in the manufacture of boots and shoes." These articles are known as "half or ankle boots and shoes," and the improvement consists "in making the uppers entirely "without seam."

The leather is rendered supple by soaking; while still wet, it is pressed by means of a forked lever into contact with every part (except the sole) of a last, which is the counterpart of the article to be made. The edges of the leather are then secured to the sole of the last; and when dry or nearly so, the blocked upper is ready for the reception of the welt and sole, which may be applied by sewing or pegging. If springs are to be put into the uppers, "incisions must be "made to admit them."

[Printed, 4d. No Drawings.]

A.D. 1862, March 5.—No. 597.

SOMERVELL, JOHN, SOMERVELL, ROBERT MILLER, and BLANC, MARIUS.—"Improvements in the manufacture of "boots and shoes." The sole is of wood; an angular groove is cut in the edge, and the upper is attached by means of wire nails or U shaped staples. A piece of leather is sprigged on to the sole and heel so as to cover them, and this piece is protected by hobs or other strong nails or by tips or plates. An imitation welt (for the purpose of hiding the heads of the wire nails) is formed "by inserting the nails a short distance "from the edge of the upper;" the margin of leather thus left is "worked up and afterwards set." A shaped iron plate is sometimes screwed on to the waist to increase its strength.

[Printed, 4d. No Drawings.]

A.D. 1862, March 5.—No. 600.

BOSTOCK, THOMAS.—"Improvements in the manufacture of "boots and shoes." This invention relates to the preparation

of soles, heels, and other parts of the bottoms of boots and shoes before they are attached to the uppers or welts. The hardening of the leather, the bedding of it to the bottom of the last, the shaping of the edges, and the hardening of the edges, are effected by a single process.

The invention requires a block of wood or metal (perforated throughout its thickness to the size and shape of the sole, heel, or other part) and two dies (male and female) "corresponding in form on their adjacent upper and under surfaces with the convex surface of the bottom of the last and accurately fitting at their edges within the perforation of the block."

The piece of leather to be operated upon is cut to the required shape; its edges are bevelled "in order that the surface of the leather which receives the convex die shall be larger than the other surface." The piece is placed (wet or dry) between the dies, and the dies are put into the block; pressure or percussion being applied, the piece receives the required bedding and solidifying of both surfaces and edges simultaneously and requires no further trimming.

[Printed, 4d. No Drawings.]

A.D. 1862, March 13.—No. 687.

WADSWORTH, JAMES.—"Improvements in the construction and manufacture of moveable or adjustable heels for boots and shoes." This heel is built up in the following manner:—A disc fixed to the boot or shoe has in the centre a boss, and on the lower side four projecting parts which "are formed into annular segments or flanches by knurling or milling;" it is also perforated on one side for the passage of a pin. Inside the boss is a spring riveted to a metal plate; the free end of this spring yields when acted upon by the pin. A disc forming the top portion of the moveable part has a central recess which fits over the boss; it has four projecting parts which are knurled or milled to fit under the segments, and between them recesses, "into one or other of which the spring enters when the flanches of the two plates or discs are brought fully in contact with each other." A ring of wood ("boiled or steeped in oil to prevent it varying from changes of the weather") is screwed to the under side of the moveable disc; it is made with a projection which fits the hole of a ring of leather screwed to the wood and forming with the projection

the bottom of the heel. The moveable portion of the heel is turned partially round by raising the spring from its recess.

In some heels the discs are attached by a central screw which keeps them "in close contact with a spring catch or "detent taking into notches or recesses for the purpose of "preventing rotation of the heel during use." The screw is independent of one of the moveable plates so that the heel can be turned without slackening the screw.

In others more than one screw is used; the screws must be withdrawn or partially so when the heel requires turning.

[Printed, *sz.* Drawing.]

A.D. 1862, March 17.—No. 728.

STOCKER, ALEXANDER SOUTHWOOD, and STOCKER, ALEXANDER RICHMOND.—"Improvements in the manufacture and "construction of metal boot heels and tips and horse shoes." These heels or tips are made from rods of iron indented or grooved (by rolling or otherwise) on the side which comes next to the boot or shoe, the object being to render the article "more easily perforated and countersunk" and lighter.

In the machine for bending the iron the patentees propose to set the main framing (when at work) "at an angle of about "30° of inclination." A crank on the middle of the main driving shaft gives motion to an adjustable connecting rod, which is coupled to a slide working in a dovetailed groove in the top of the bed plate. A shaper, consisting of a block of the contour of the article to be bent is secured to the upper end of a square sliding bar; it projects slightly above the surface of the slide, but is prevented from rising until required by a weight suspended from the lower end of the bar. Two horizontal bending rollers carried by transverse slides are moved towards each other by inclines on a cross piece which is secured to the under side of the slide.

A straight bar of the proper length is placed against a stop; the slide brings the shaper against the middle of the bar and forces it between the rollers. The rollers advance and cause the ends of the partially formed heel to be pressed against the narrower end of the shaper. The heel tip is released "by "causing the shaper to rise above the surface of the slide;" it descends along the slide and drops down an aperture through the bed plate. The traverse of the bending rollers,

the inclines, and the slide can be adjusted for making articles of different sizes. The machine is described at length in the Specification.

“An improved five-hole bed for facilitating the countersinking or indenting heel tips:”—This bed is a cast iron block; in the middle is a raised portion of the shape of the inner part of the tip, and round the raised portion are holes corresponding to those to be made in the tip. The bed has a handle fixed to it for putting it into a press. A bent blank heated to the desired temperature is laid on the bed round the raised portion, and a tool carrying five projections is brought down on the blank and countersinks the several holes. As the tool rises the tip is held down by a “releaser,” and the bed with the tip on it is drawn out of the press.

The patentees describe modifications of the countersinking tool and of the process of countersinking.

[Printed, 10*d.* Drawing.]

A.D. 1862, March 18.—No. 757.

WRIGHT, JAMES, and WHEATCROFT, HENRY. — (*Provisional protection only.*)—“Improvements in apparatus or “machinery for lasting and making boots and shoes.” Four sliding plates are mounted on a stand or frame; two correspond in outline to the sides of the boot or shoe, two fit the toe and heel. These plates are adjustable by screws to any size; they slide in grooves and open and shut “by the action of two “parallel shafts on which are mounted cams pressing against “the two side plates.” The ends of the side plates are wedge-shaped “so as to embrace the two toe and heel pieces.” By this arrangement all the plates can be closed simultaneously; they are kept open by a spring.

The last with the upper and the insole thereon is placed within the plates and is supported at each end from underneath; the plates are then closed, and the upper is thereby stretched and made to fit the last accurately. Pincers, mounted “on “the same spindle which actuates the slide,” grasp the projecting edges of the leather, stretch it tight and keep it so until the workman has pegged the upper to the insole; the pegs are put in “through holes or slots in the edges of the sliding “plates.”

[Printed, 4*d.* No Drawings.]

A.D. 1862, April 10.—No. 1036.

DAFT, THOMAS BARNABAS. — (*Provisional protection not allowed.*)—"Improvements in coverings for the feet," namely, in goloshes. A "vulcanized india-rubber mocassin" is made from two flat pieces of sheet india-rubber compound by connecting them at their edges and then vulcanizing them. In this manner "a cap is made" which fits over the front part of the sole and upper of a boot or shoe; the portion passing over the upper is of such size as to protect it from wet and dirt; while the portion under the sole extends as far as the waist and "fits perfectly close so as to prevent mud working in" between the sole and it. The mouth of the cap is made somewhat smaller than the part which it is to cover, so that it may require stretching and clasp the boot or shoe closely. The mocassin or golosh is fastened on by strings or straps attached to it at the middle of the upper part; these pass round the ankle and are there secured. The under portion may be thickened by an additional piece of india-rubber.

[Printed, 4d. No Drawings.]

A.D. 1862, April 11.—No. 1045.

RIGOLLOT, FRANÇOIS.—"Improvements in machinery or "apparatus for manufacturing riveting pegs for boots and "shoes, and other pins or pegs." A driving shaft mounted on three pedestals or brackets carries two eccentrics, a cam pulley, and a fly wheel. The eccentrics carry connecting rods "which "move the knives of a shears." The pulley "has a groove "passing thrice round it and crossing." The crossing gives "an alternate come-and-go motion" to a side block by means of a "shuttle with tempered steel spindle" sliding in the groove. "The principal and essential object of this pulley is "to render the oblique motion of the carriages alternate, precise, and invariable, so that the cutting of the pegs can only "take place when the carriages are in absolute repose," by which means pegs of the same number or denomination are always of the same length.

The patentee attaches great importance to the invention and application of the cam pulley.

A regulator "placed at the side of the framing" diminishes or increases the come-and-go and the oblique motion of the carriages. On the framing are two metal plates, "each carry-

“ing ten or more carriages fixed to it by a spindle-forming pivot, and permitting said carriages to move obliquely”; on it is also a connecting rod, “which transmits the oblique motion from the right to the left side of the machine.”

Bands of sheet iron or other metal, “cut to a breadth regulated by the number or denomination of peg required,” are placed in the carriages. The bands are brought beneath the shears “by means of two steel claws or catches placed on each side within the carriage.” The claws receive their come-and-go motion by means of two levers placed on each side of the carriage. The carriages are formed to receive bands “of five or six different breadths.”

At the first turn of the cam pulley the side block is drawn forward, the carriages “are placed obliquely to the right,” and the pegs are cut; at the second turn the side block is pushed back, the carriages “move obliquely to the left,” and other pegs are cut, “and so on continuously.”

The Specification contains a very full description of the machine, of its action, and of two arrangements of carriages.

[Printed, 10d. Drawing.]

A.D. 1862, April 15.—No. 1092.

CROSSDALE, JAMES. — (*Provisional protection only.*)—“Improvements in boots and shoes for ventilating same.” This invention relates to an improved arrangement of the elastic tubing described in the Specification of Letters Patent which were granted to Mr. Crossdale on April 12th, 1859, No. 919.

The tubing is now carried “along the entire length of the insole of boots and shoes”; the open ends terminate “at the heels thereof and between same and the top of the counters of same.” By this arrangement the entire surface of the insole “is left free, and may be perforated throughout its entire length.”

[Printed, 4d. No Drawings.]

A.D. 1862, April 16.—No. 1113.

FORD, JOHN WILLIAM. — (*A communication from Gordon McKay and Robert Henry Mathies.*)—“Improvements in sewing machines.” This invention consists of 13 improvements on the sewing mechanism patented by Mr. Blake on May 3rd, 1859, No. 1111. Some of the improvements are applicable

to other sewing machines, "chiefly such as are used on heavy material and for manufacturing purposes."

1. The horn "can be rotated with the stock upon it in reference to the needle and feeder, when it is desired to have the seam conform to curves or angles," instead of turning the stock upon the horn, or of turning the needle and feeder with reference to the horn. The thread, spool, and tension device rotate with the horn.

2. The rotating whirl or looper is so combined with the rotating horn, that "while the whirl has an intermittent rotatory movement with relation to the needle, the horn can be rotated without changing the relative rotation of the whirl and needle to each other," or, in other words, the rotation of the horn shall not rotate the whirl, though supported by and held in the horn."

3. The lengths of the loops drawn by the needle from the spool are varied "so as to conform to varying thicknesses of stock, by automatically adjusting or varying the stroke of the needle by the thickness of the stock at or near the point where the needle is operating."

4. The presser foot can be lifted from the surface of the stock "to relieve the thread from pinch between the bed and the under surface of the stock while the thread is drawing through the stock."

5. The presser foot is so combined with the needle and the parts connected therewith, "that the resistance offered to the upward movement of the needle reacts upon the presser to prevent it from being forced upward from the needle, the presser being prevented from downward motion."

6. The "closing slide of the needle" and the needle are so combined that the stroke of the slide is "increased or diminished automatically" as the stroke of the needle is increased or diminished.

7. The slide is so placed as to cover the hook of the needle while emerging from the stock, and to move with the needle, keeping the hook covered "till at or near the termination of the upward stroke of the needle"; it then "moves relatively to the needle," uncovering the hook, and then by moving downward with the needle keeps the hook uncovered until the needle punctures the stock.

8. The presser and feeder are arranged "directly in front of the hook of the needle, in proximity to the needle in the

“plane of the vibrations of the feeder and above the stock” so as to operate on the upper surface thereof.

9. The presser and feeder are so combined that they can be lifted together to facilitate placing the stock upon the horn or taking it off.

10. The extent of the feeding action of the feeder is controlled “by making the presser adjustable toward and from the needle, and by constructing the presser with an inclined surface next the feeder.”

11. With the needle bar is combined a lever “which reciprocates said bar when its fulcrum is so arranged as to be made moveable for the purpose of changing the throw of said bar.”

12. The stroke of the needle “to conform to change in the length of the stitch” is varied by means of “a stop made adjustable on the fulcrum bar to vary the distance between said stop and the fulcrum.”

13. A spring is combined with the parts connected with the needle lever, “so as to counterbalance the weight of said parts, so as to retain the needle at its up stroke” as long as is required.

The Specification contains a full explanation of all the connecting parts and a description of the operation of the machine.

[Printed, 3s. 6d. Drawings.]

A.D. 1862, April 17.—No. 1131.

GALLAGHER, HENRY.—(*Provisional protection only.*)—“Improvements in overalls, leggings, or in over-boots.” The leg portion is made of such dimensions that it can be readily drawn-on over the boots or shoes and trousers; the height may vary and reach to just above the ankle, half-way up the leg, or to cover the knee. The sole is “of a peculiar character” it having in fact no sole beneath the ball part of the foot.” The toe part is by preference of steel or iron, and the waist is much lighter than in ordinary boots and shoes. To facilitate the pulling on and off and to secure the over-boot on the leg an elastic side spring is introduced “to some height from the ankle;” or an opening may be made down one side, “so as to enable the side to be thrown open like a flap,” which can be closed in like manner to ordinary leggings.

The side spring may be applied to all leggings or knickerbockers, in which case there need not be any side opening therein.

[Printed, 4*l*. No Drawings.]

A.D. 1862, April 26.—No. 1237.

LESTER, AARON.—“Improvements in the manufacture of
“ the fronts or uppers of slippers, shoes, boots, and gaiters,
“ and of mats, bags, fire-screens, and various other articles
“ which are usually made of ornamental or Berlin needle-
“ work.” The object of this invention is to substitute mechanical means for hand labour in the production of these articles.

The intended pattern, “having been drawn upon the
“ ordinary draught paper, is read-off,” and the chain of cards is prepared as for jacquard weaving. The fabric is then woven with the pattern thereon, so that when it is made up, “the
“ article will present the appearance of fine needlework
“ produced by hand.”

When imitation Berlin woolwork is to be produced, “an
“ ordinary canvas groundwork is to be woven simultaneously
“ with the pattern.”

[Printed, 4*l*. No Drawings.]

A.D. 1862, May 6.—No. 1343.

CABOURG, THOMAS.—“Improvements in machines for the
“ purpose of uniting together by means of screws leather used
“ in the manufacture of boots and shoes and other articles
“ composed of two or more pieces of leather.” This machine (which may be worked by hand or other power) will form a screw thread upon a continuous length of wire, cause the threaded wire to penetrate the leather (without a hole previously pierced therein), and cut off the portion introduced.

The wire is coiled round “a pulley with a large groove;” it passes from the pulley through a hollow axle, which imparts to it “a progressive spiral motion;” it then enters a “tapping plate” and has the thread cut upon it; from the plate it passes through a guide and enters the leather (which is held up to it); after penetrating to a sufficient depth it is cut by a pair of knives which “give it an oblique cut so as to form a

“sharp point upon the succeeding part” for more easy penetration into the leather presented to it.

The pulley is mounted in a rectangular frame, which is supported at one end by an upright and at the other by the hollow axle. The hollow axle turns in uprights and carries a pinion which gears with a toothed wheel and handle. The tapping plate (which is regulated by a screw) is at the exit end of the hollow axle. The knives (which are worked by a treadle) “are actuated simultaneously, and the edges having “the form of an inverted V, they perform a double cut, one “to the right against the left to cut off the tapped wire, and “the other oblique for the purpose of making a point to the “extremity of the wire.” All the mechanism connected with the knives is fixed to a plate which is bolted to two pieces cast with one of the uprights. This mechanism consists of (1) a lever connected at one end to a treadle and formed at the other with a fork, which embraces (2) a stud carried by a vertical sliding shaft; on the shaft are two lugs to which are attached the lower ends of (3) two rods, the upper ends being connected to (4) two curved levers. The upper ends of these levers terminate each in a fork for the purpose of actuating (5) studs fixed in the shanks of the knives. The shanks are “formed square in section” within guides “to prevent them “from turning round when acted on by the levers.” The distance or movement of the knives is regulated by a screw, and the knives “are brought back to their normal condition” by a spring.

[Printed, 8d. Drawing.]

A.D. 1862, May 8.—No. 1377.

BEARNE, ANDREW.—(*Provisional protection only.*)—“Improvements in the construction of boots, shoes, and goloshes, “rendering them elastic to pressure.” The inventor hollows-out the heels of these articles internally and places in the cavity “an elastic bed or cushion, or bed and cushion of “vulcanite or other suitable material” of sufficient size “to “present an elastic medium” when pressed on by the heel. A thin covering of leather or other substance is placed over the cushions.

[Printed, 4d. No Drawings.]

A.D. 1862, May 10.—No. 1403.

CLARK, WILLIAM.—(*A communication from Jean Louis Abeilhau.*)—"The application of a vegetable fibre alone or in " combination with other matters in the manufacture of felted " and other fabrics, also a substitute for flock or powdered " wool, and as a material for padding or stuffing, and for " other useful purposes." The patentee utilizes the down of " aquatic plants technically termed typha, and commonly " known as reeds or bulrushes."

When the down is sufficiently dry, it is separated from the seeds, worked until it possesses the fineness of silk, mixed with one-third or one-half the quantity of hare's or rabbit's or beaver's hair, and felted. This felt may be used for shakos, hats, caps, hat bodies, and linings; and when combined with caoutchouc, gutta percha, or like matters, it forms a substitute for leather, to be employed in the manufacture of " coverings for " the feet."

[Printed, 4d. No Drawings.]

A.D. 1862, May 16.—No. 1494.

NEWTON, ALFRED VINCENT.—(*A communication from Caleb Griffin.*)—"Improved machinery applicable to the " cutting of leather and other like uses." This machine is especially intended for cutting leather into soles for boots and shoes; it is worked by a treadle; the improvement " relates more particularly to the operation of the knife," and consists "in communicating to it a vibrating motion " in the arc of a circle or in a curve approximating thereto." The machine may be made with one knife, but "as a rule will " be made with two."

The frame consists of two side plates connected above and below by cross bars. In front is a table and "immediately " at the rear end of the table" is a slide down which the soles slide when cut; there is also at the rear of the table a gauge adjustable so as to cause the knives "to cut a wide " or narrow sole as required by simply forcing the leather up " against the gauge after every stroke" of the knives. On the upper edges of the plates are lugs having pivoted to them arms whose other ends are pivoted to the ends of the cutter heads. These cutter heads are slotted bars so that the knives

can be adjusted in them "to cut either a large or small sole." The knives "may either be made directly in the proper shape "to cut out the side of a sole" or (by preference) of a thin sheet of steel "bent and held in form between two clamps" shaped for such purpose by means of screws passing through the clamps and forming the knife holders. From one end of the cutter heads depends a moveable arm, on the lower end and inner side of which is formed or fixed a pin. This takes into a slot "of peculiar form" made in the side of the plates; by this means the knives "during the first part" of their descent are "turned in towards the centre of the arc," whilst during the latter part they are made "to enter the leather at right angles to its upper side." This peculiar motion prevents the knives from "being brought in contact "with each other whilst vibrating in different directions," as it is necessary for the efficient working of the machine, "that one knife should be ascending whilst the other is "descending." The slot is differently shaped if only one knife is used, or if the two knives are arranged "to cut two "soles at a time."

[Printed, 10*l*. Drawing.]

A.D. 1862, May 16.—No. 1495.

NEWTON, ALFRED VINCENT. — (*A communication from Caleb Griffin.*) — "Machinery applicable to the cutting-out "of boot and shoe soles and kindred operations." The framework, connected at top and bottom by cross beams and a feed table, carries a driving shaft which may be driven by a treadle or by other power. On each end of the shaft and outside the framework is spur gearing actuating connecting rods whose upper ends are attached by studs to a pressure beam. On the axle of one of these rods is another rod whose upper end is attached to a stud projecting from a disc, which "has an intermittent rotary reciprocating motion upon a "stud" made fast on the framework. On the same stud is mounted a spur wheel carrying on its side a ring in whose edge are four notches "to receive successively a spring catch," thereby causing the wheel to rotate one quarter, "which in "turn imparts motion to a pinion." This pinion is mounted on a transverse shaft, "which forms the axle of a rotating "cutter or die block fitted on its opposite sides with cutting

"dies." The pinion being half the size of the wheel will present the die cutters "on the opposite faces of the block alternately to the sole leather once for each quarter revolution of the wheel," and each time that one of the cutters is presented, the pressure beam will descend and "cause the dies to cut such leather as may have been interposed between them into soles." The dies are so arranged "that the one when used will cut out the toe on one side whilst the other cuts it out on the other side, (that is to say) cutting out the soles with the heel and toe on the same side of the strip of leather alternately." When the sole has been cut out, a spring forces it out of the die upon "a guide apron."

The Specification contains full particulars of the foregoing parts of the machine and of many others which are required for the complete development of the invention.

[Printed, 10*d.* Drawing.]

A.D. 1862, May 20.—No. 1522.

TALLERMAN, REBECCA, and TALLERMAN, LEWIS ABRAHAM.—(*Provisional protection only.*)—"An improved method of protecting ladies' and childrens' boots and shoes." This covering is made of leather, cloth, or other suitable material; it is worn over the boot or shoe and reaches eight or nine inches up the leg. It is fastened at the side by hooks, buttons, or other contrivance, under the waist by a strap or elastic band, and at the toe by a small piece of sole leather or other substance.

[Printed, 4*d.* No Drawings.]

A.D. 1862, May 29.—No. 1612.

BOISSET, PIERRE, and ANTOGNINI, BERNARDO.—"Improvements in the manufacture of boots and shoes." The soles and heels are made of india-rubber or gutta percha. During the manufacture of the soles metal nuts are imbedded therein, and screwed holes are pierced therein above the nuts. The soles are screwed to the upper and the insole from the inside. Or a plate pierced with holes to receive the screws may be imbedded in the sole; this however adds to the weight of the sole.

Near the outer edge of the heel a frame or bar "with long metal points" is imbedded in the material, so that the

points come flush with the bottom of the heel and "take the wear." The points may go all round the heel or only round the portion most subject to wear. Or points without a frame may be imbedded in the heel, care being taken to make their surfaces "somewhat rough so as to incorporate the same well" with the surrounding material. The upper portion of the heel may be of leather; it may be cemented to the shank and be fastened to the upper and insole in the usual manner.

A similar frame with points may be imbedded in any part of the outer sole which is subject to wear away fast.

[Printed, *8d.* Drawing.]

A.D. 1862, May 31.—No. 1651.

NEWTON, WILLIAM EDWARD. — (*A communication from William Elmer.*)—"Improvements in the treatment of cloth " and other textures, leather, or animal tissues, for the purpose " of rendering them more durable and impermeable to water " and other fluids, and for producing from any firm fibrous " texture, such as cloth, cotton, woollen or mixed goods, a " durable artificial leather." The first part of this invention applies to "wearing apparel, as overcoats, cloaks, boots, shoes, " hats, caps, or any other article of clothing desirable;" the articles will be rendered waterproof, while the external appearance of the cloth side "will retain all the original beauty and properties," and the other side "will be found to possess all " the softness and pliability of the finest kid leather."

The material is first subjected to the action of "alumina or " other true mordant," preference being given to alumina. If the material has been dyed, and only one side is to be treated, care must be taken to prevent the alumina from penetrating and forming a deposit on the opposite side. The alumina is applied in the form of a solution, one part (usually the sulphate) to two parts by weight of gelatine (each previously dissolved), "so as to form a thick solution or paste." The solution should be well worked into the texture of the material. When the material is partially dried at a temperature of about 100 Fahr., a solution of tannin is applied. After the water from the tannin has nearly evaporated the material is steamed, passed between rollers, again mordanted and carefully dried

at a temperature of about 150° Fahr. "in a well-ventilated " room from which the sun's rays are excluded." The material now receives a coating of india-rubber or gutta percha or of the two combined; the preparation of this coating is described in the Specification. The coated material is passed between rollers, the one which comes into contact with the coated side being heated to from 250° to 300° Fahr.; after this it is coated with a paste made of alumina one part and fish glue two parts (by weight), and when partially dried "it is placed in " contact with a strong solution of tannic acid or other analogous substances for from 6 to 12 hours." The final processes are steaming for about 30 minutes, carefully applying " oil of birch or naphtha or other analogous substances," and again steaming for about 30 minutes.

In preparing leather gelatine is not required, and "the " surplus oil and grease" is removed by means of benzole before the application of the alumina.

[Printed, 6d. No Drawings.]

A.D. 1862, June 20.—No. 1824.

OSMAN, CHARLES. — (*Provisional protection only.*)—"Im-
" provements in the manufacture of elastic or yielding surfaces
" for sitting, lying, or reclining upon, part of which improve-
" ments are applicable to other purposes." This invention is divided into four parts, all relating to the application of vulcanized india-rubber.

The fourth part consists in manufacturing "corrugated or " channelled surfaces" of vulcanized india-rubber, and these the inventor informs us are suitable for being applied to the " soles of boots, shoes, and clogs."

[Printed, 4d. No Drawings.]

A.D. 1862, July 3.—No. 1943.

MILES, JAMES.—"Improvements in machinery for cutting
" out soles and other parts used in the manufacture of boots
" and shoes, and also parts used in the manufacture of other
" articles." The principal parts of the machinery are (1) an adjustable table over which the leather travels towards the cutters; (2) two adjustable beds of hard wood (fitted into iron

boxes) whereon the leather lies while being cut; (3) a platen raised and lowered by gearing which is set in motion by hand or other power; (4) two cutters, "formed suitably to cut the sole for the right and for the left foot respectively," and affixed to the bottom of the platen in such manner that they can be readily changed; (5) two claws projecting from the beds, carrying off "the waste scraps left by the action of the machine," and forming when stationary a stop to regulate the advance of the leather; (6) quadrant guides regulating the passage of the leather under the cutters and capable of "both parallel and circular adjustment" by means of slots and thumbscrews; (7) the requisite gearing according as the machine is worked by hand or other power.

The beds are adjustable in height by means of a "male and female screw and hand wheel." The cutters are "slightly bevelled in the interior"; at each descent they strike through the leather; the cut soles are "forced successively up through them and the platen," and guided by "an inclined partition" and by "other inclines" pass out into a receptacle. The movement is given to the claws (and their arms) by a cam wheel, "to which two cams are affixed in opposite directions;" these are of different heights, and "by their joint action raise, carry forward, and again depress the horizontal arm to which are attached the sliding arm and claws." The sliding arm and claws "have also a sliding motion upon an oscillating piston," and are brought back to their original position by a spring coil on the piston.

[Printed, *8d.* Drawing.]

A.D. 1862, July 10.—No. 1990.

TOWNSEND, ELMER.—(*A communication from Joseph Foster Sargent.*)—"A new and useful invention for making nails and driving such nails into the sole of a boot or shoe." The nails are made from a strip of metal reduced by rolling to "about twice the width of the nail-strip to be produced" and to the appearance "of two wedges connected together at their points and projected in opposite directions." The strip is divided lengthways so as to form two similar nail strips, and the thin part of each is "condensed and smoothed" and freed "from any bur." The prepared strip is fed forward in the machine across the edge of the cutter; the nail "enters a

"vertical recess" formed in a vibrator, "one side of such recess being formed by another knife."

The machine is usually driven by a treadle. The headstock supported on a standard carries a driving shaft "whose front part extends through a tubular shaft or sleeve." A vibrator or "pendulous arm or frame" supported by the sleeve is capable "of being turned or vibrated thereon." The vibrator carries a "nail-driver carrier," a "serrated foot by which the feeding of the shoe along is effected," and sometimes an awl for punching a hole "for the reception of the next tack." The foot operates with what the patentee terms a retainer "worked upwards and downwards at the proper times" by the action of a cam on the driving shaft. The carrier slides up and down in the vibrator, being raised by a cam and pressed down by one or more springs.

The edge of the sole "rests directly" against a roller "which is carried by a slider adjustable by a clamp screw." The boot or shoe is supported on a last; the heel of the last "receives one arm of a lever" constituting "part of a last supporter which is furnished with a toe rest." The last supporter is connected to "a swivel head (placed on the upper end of a secondary lever)" by a screw and nut so as to enable the supporter "to be tilted on such screw" and vary the position of the sole that the nails may be driven in perpendicularly or nearly so. The swivel head "should be so adapted to the upper arm of the lever" as to be capable of being revolved thereon horizontally or nearly so "to allow the shoe to be turned around in such manner as may be necessary to cause the nails to be driven in a continuous row" round the sole or any part thereof. The secondary lever has its fulcrum "at the upper end of a primary lever," which is so connected at its lower end to a treadle or lever as to admit of its being moved either toward or away from the standard of the machine "in a plane parallel to the front face" of the vibrator. A heavy weight on the rear arm of this treadle is adjustable longitudinally thereon; the two serve to press the shoe upward against the sole and "to counterpoise the momentum of descent of the nail driver."

The Specification contains a detailed description of the machine.

[Printed, 10d. Drawing.]

A.D. 1862, August 1.—No. 2184.

MARSH, JOHN EDWIN.—“Improvements in metal rivets used “ in joining or securing together parts of boots, shoes, and “ other articles of leather, and also in machinery for making “ such rivets.” The points of these rivets are made “flat, “ with two sides only, or what are termed chisel pointed, or “ as nearly approaching this form as possible.” The point has sufficient strength to allow of its being clinched.

The improvement in machinery for making the rivets consists in the alteration of the cutters, “which require to be “ sunk to the form necessary to produce the flat point.” The patentee does not describe the machinery employed, presuming that the alteration required “will be readily comprehended by any mechanic accustomed to the making or “ working of the class of machines employed in this trade.”

[Printed, 4d. No Drawings.]

A.D. 1862, August 5.—No. 2195.

SIMON, SIEGFRIED.—(*Provisional protection only.*)—“An “ improvement in ornamenting ladies’ and children’s slippers.” Any ornamental design is cut or stamped out of the front of the uppers, and a piece of differently coloured leather is gummed on and then stitched to the back of the uppers so as to show through the perforations. It is preferred that the back piece should be the complementary colour of the upper, and the stitching is to follow the outline of the design. The colour of the binding should harmonize with that of the upper. The inside lining covers the back piece.

[Printed, 4d. No Drawings.]

A.D. 1862, August 6.—No. 2207.

NAUHEIM, FERDINAND.—(*Provisional protection only.*)—“An improvement in the ornamenting of boots, shoes, and “ goloshes,” which are made of enamelled leather. The ornament may consist of “any appropriate device;” the effect is obtained by removing the gloss from the part “where the “ ornament occurs,” the glossy surface being left “to form “ the back ground.” This dulling of the surface may be effected in various ways; the inventor prefers to place a stencil plate cut to the form of the device on the enamelled leather

and to destroy the exposed glossy surface by friction with pumice stone or other suitable material.

[Printed, 4d. No Drawings.]

A.D. 1862, September 24.—No. 2603.

TAYLOR, WILLIAM.—(*Provisional protection only.*)—"Improvements in blacking or polish." The inventor dispenses with the ordinary ingredients, viz. "oil, treacle, and vitriol." He reduces "slack coal or its equivalent" to fine powder, adds thereto indigo, and forms of the mixture a paste by the addition of "fruits, such as for instance foreign fruits termed "currants, raisins, dates, and the like, or any one of these "reduced to a jelly," animal jelly, or "any part of the flesh "of animals that will make jelly," tallow, suet, or any other fatty matter, and "acetic acid and lemon, the same being "formed into a syrup by putting the lemons into the acid."

[Printed, 4d. No Drawings.]

A.D. 1862, October 21.—No. 2836.

BOUSFIELD, GEORGE TOMLINSON.—(*A communication from Daniel Edwin Hayward.*)—"Improvements in the "manufacture of boots and shoes." These articles are made with leather uppers and insoles and vulcanized rubber outer soles, and the advantage claimed is that the outer sole will not be liable to be torn off from the upper and insole.

The outer sole is formed in a mould which consists of two parts; the lower part holds the india-rubber compound; the upper part has a row of holes around its outer edge to receive the stems of rivets or nails. A piece of stout cloth or canvas of the shape of the outer sole is laid on the upper part; the rivets are pushed through it into the holes; the two parts of the mould are secured together; the sole is "vulcanized in "contact with the canvas," thereby causing the two to adhere firmly to each other, whilst the heads of the rivets are imbedded in the rubber, and the stems project.

The last used is steel-plated, and the stems passing through the upper and insole are clinched.

The shank part "may be nailed through its edge from the "outside." The canvas may be dispensed with, but it is not considered advisable to do so "particularly for light soles."

[Printed, 1s. Drawings.]

A.D. 1862, October 31.—No. 2941.

ANDREWS, ALFRED.—(*Provisional protection only*).—"An improved tool for cutting and rasping pegs in boots and shoes." The tool consists of a flat shank provided at one end with an appliance "in the form of a rasp at bottom" and "a cutting edge at top so formed with ears or guards" that no cutting of the upper leather or lining can occur. At the other end the appliance is in the form of "a hollow figure" with a cutting edge, a form which also prevents any cutting of the upper or lining.

The ends if preferred may have similar appliances; or the shank may be made with an appliance at one end only.

[Printed, *4d.* No Drawings.]

A.D. 1862, October 31.—No. 2953.

ANDERTON, JAMES JOHN.—(*Provisional protection only*).—"A new or improved mode and means for the production of leather from waste leather scraps, and also for producing from such waste leather scraps in combination with india-rubber, gutta percha, or other like substance a new material to be used as leather, and for other purposes." Sheets of leather thus produced are "specially adapted for sole leather" as well as for "a variety of other purposes."

Waste or scrap leather is reduced to shreds; the shreds (either alone or mixed with about one-third of india-rubber or gutta percha in solution) are spread on the surface of a perforated tray and are pressed into a solid sheet; the sheet is corrugated by passing between ribbed rollers and is finished off between glazing rollers.

The machine for cutting-up the waste leather consists principally of a hopper; a box under the hopper and provided with cutters; a cylinder inside the box, carried by a vertical shaft and provided with similar cutters; gearing; and a shoot for the removal of the shreds.

A machine for reducing the waste leather "into finer shreds or fibres" is composed mainly of a conical box carrying cutters on its inner surface, and of an adjustable conical drum revolving inside the box and carrying cutters on its outer surface.

The inventor claims "the peculiar construction and arrangement" of the machinery. Sometimes the corrugating rollers are provided with points for perforating the sheets.

[Printed, 8d. Drawing.]

A.D. 1862, November 20.—No. 3114.

HUTCHINGS, JOHN THOMAS. — (*Provisional protection only.*)—"Improvements in the construction of waterproof "boot and shoe soles." These soles consist of india-rubber with a border or edging of leather, such that when the two are joined together a sole of the required size is produced. Before the attachment of the rubber and leather "the uniform surface "of the outer or top part of the sole" is destroyed by "indenting, fluting, grooving, or perforating," and when this has been done, the edge of the rubber is channelled to receive the leather border. Sometimes the india-rubber sole is of "the multicapsular pattern" (patented by Mr. Hutchings on March 11th, 1861, No. 602), the object in all cases being to produce a sole which is waterproof and secures the wearer from accident in slippery places.

The sole can be attached "by any of the usual methods."

[Printed, 4d. No Drawings.]

A.D. 1862, November 21.—No. 3133.

WAGNER, CHARLES. — (*A communication from Franz Vester.*)—"Improvements in strengthening, securing, and rendering more durable the soles or bottoms of boots, shoes, "and other coverings for the feet." The soles and heels, whether made of one or several thicknesses of material are strengthened by means of stout metallic studs or rivets having broad heads. The stems are passed through holes in the material; a washer is passed over each stem, and the end of the stem is hammered down until the material is firmly clamped between the heads and the washers. Or the studs may be made conical or tapering, and a "wearing washer" be passed over each before the stud is put through the hole in the material; both ends are then to be hammered down. Or the ends of the stems may be tapped for the reception of nuts. The surfaces of the heads and washers may be serrated or roughened.

These strengthened soles and heels can be fastened on by any of the means now in use; there should always be an insole or its equivalent to cover the inner ends of the studs and washers.

[Printed, 8d. Drawing.]

A.D. 1862, November 26.—No. 3173.

AUSTIN, WILLIAM.—(*Provisional protection only.*)—"An improved material for the manufacture of cartridge cases, applicable also for tubing and various other useful purposes," among which are mentioned "shoes and boots."

The material consists of a woven fabric coated with an adhesive solution, covered on one or both sides with a layer of paper and then subjected to pressure. Or paper pulp may be spread on each side of the coated fabric and be pressed into the interstices thereof. Or instead of a woven fabric "fibres of various descriptions intermixed with pulp or laid between sheets of paper" may be used. The solution may be water-proof or not. The surface of the material may be varnished or lacquered. To obtain "a very thick substance," several sheets of the material are pressed together.

[Printed, 4d. No Drawings.]

A.D. 1862, November 26.—No. 3174.

DANKS, JOHN RYAN, WALKER, BERNARD PEARD, and WALKER, ROBERT PERCY.—"Improvements in machinery or apparatus for making boot and shoe heel and toe tips, clog irons, and other similar articles." 1. A machine "in which are effected automatically the three operations of bending, punching, and levelling" a tip:—Two bent levers turning on pivots are mounted on a moveable piece (either a lever turning on an axis or a piece sliding between guides), which has a reciprocating motion communicated to it by a crank and connecting rod. The levers carry "moulding tools," which close upon a "former," bend the tip round it, and hold the tip in position whilst it is being punched. The closing of the levers is caused by their outer ends coming into contact before the end of the stroke with adjustable stop screws. The punching apparatus is perpendicular to the former; it consists of a slide carrying at its lower end as many punches as there are

holes in the former; it is actuated by a lever arranged "so as to allow of the parallel movement" thereof. "The friction of the punches in the nail holes lifts the tip from off the former" until it is brought into contact with a "releaser." The machinery being "placed at an angle," the tip falls by its own gravity into a channel and thence on to an anvil when a hammer levels or flattens it; when the hammer ascends the tip falls into a receptacle "ready finished for polishing."

2. A machine may be combined or not with the foregoing "for cutting off the proper lengths of tip iron from the rod;" to this the patentees lay no claim.

3. A machine for bending straight lengths of iron into shape of tips &c. :—A framing supporting a plate is "furnished with proper carriages and bearings" in which the axle of a disc revolves. Suitable tools or formers are attached to the periphery of the disc, and as the disc revolves, the formers carry the length between rollers attached to levers which turn upon pins fixed in the plate. The outer ends of the levers are kept asunder by a spring, and the distance to which they separate is regulated by screws. The action of this machine is explained in the Specification.

4. Apparatus for punching nail holes in blank tips "whilst they are still retained in the cavity of the shaping die":—The "essential parts" are (1) a mould perforated with the required number of holes; (2) a frame sliding on pillars and kept in contact with the heads of the pillars by coiled springs; (3) punches secured to a base plate and passing up through the holes of the mould when the frame is depressed by (4) a "counterpart tool" fixed "to the bolt of a press."

All the foregoing admit of various modifications, some of which are set forth in the Specification.

[Printed, 1s. Drawing.]

A.D. 1862, December 2.—No. 3225.

TWELVETREES, HARPER.—(*Provisional protection only.*)—"Improvements in apparatus for cleaning knives, forks, and boots." For cleaning boots the apparatus consists of (1) a wooden or metal frame in shape "something like a table;" (2) a spindle carrying one or more circular brushes and mounted "immediately under the top at one or both sides" of the table; (3) a flat piece of wood "in the centre of the table underneath

“ the top ” and “ terminating at the bottom with a small shelf ; ” (4) a fly wheel and treadle “ within the frame of the table underneath the brushes ” and communicating with a pulley on the spindle.

The brushes may be separate and wedged or otherwise fixed on to the spindle ; by preference however they form part of the spindle, bristles being put therein to form brushes. The flat piece of wood with its shelf is intended to prevent dirt, &c. from being scattered about.

[Printed, 4d. No Drawings.]

A.D. 1862, December 22.—No. 3414.

STOCKER, ALEXANDER SOUTHWOOD. — “ Improvements in rolling iron for the manufacture of tips and other articles.” This invention relates to rolling iron for the making of boot heels and toe tips plain on both its surfaces, “ rendering it suitable to be worked in conjunction with the process for piercing, indenting, and countersinking the holes (after the rods have been cut and formed into bent blanks) in accordance with and as set forth ” in the Specification of Letters Patent granted to Messrs. Stocker and Son, dated March 17th, 1862, No. 728.

The iron is rolled “ in two or more bars combined ” and is afterwards divided into single bars by the aid of shears or otherwise, “ whereby much economy in their production is obtained.”

[Printed, 4d. No Drawings.]

A.D. 1862, December 24.—No. 3439.

CLARK, WILLIAM.—(*A communication from Jean Marie Bibet, Emile Léger and Antoine Faury.*)—“ Improvements in the means of applying heat to the feet in boots, shoes, and otherwise, part of which improvements is applicable to other heating purposes.” The heat is conveyed through the heel, and the heating agent is lighted charcoal, “ which is termed carbon paste and is moulded in the form of a horse-shoe.”

The heel is hollow, made with a double bottom and hinged in front to the sole piece or camber ; both heel and sole piece are of metal. In the periphery of the upper portion of the heel are “ air inlet orifices.” The charcoal is placed on wire

gauze and is secured thereon by a gauze covering "acted on" by a spring on which the heel bears." The sole piece is pierced with holes wherewith to fix it to the leather sole; it is made with a "metal stiffening" perforated for the purpose of securing it to the leather stiffening piece. The heel is fixed at the back by means of a screw button "which also serves" to throw off the mud."

[Printed, 8d. Drawings.]

1863.

A.D. 1863, January 1.—No. 11.

BAKER, JOHN EDWARD, and LANDON, JAMES.—"Improve-
ments in the construction of boots, shoes, and other coverings
for the feet." The advantages claimed for this invention are
greater durability of the sole, a firm tread by removing the
liability to slip, and the prevention of the penetration of wet
or damp.

Circular or other shaped holes are punched through the
leather of the outer sole, extending from the fore part to the
waist. The inner edges of the holes are coated with a prepared
solution or cement, and pieces of vulcanized india-rubber or
other elastic material are fitted into the holes. "The back of
the sole" is then covered with the solution, and sheet india-
rubber or cloth is applied thereon. If the sole thus formed is
to be a clump sole, it is fastened to the sole already attached to
the boot or shoe by means of the solution; otherwise it is
fastened on in like manner to the upper and insole. The outer
sole may be further secured by stitching or pegging, &c. The
heels may be made and fastened on in the same manner as the
soles.

[Printed, 4d. No Drawings.]

A.D. 1863, January 13.—No. 111.

LESCUYER, LUCIEN.—(*Letters Patent void for want of
Final Specification.*)—"Improvements in india-rubber over-
shoes or goloshes." This overshoe has neither heel nor

waist; it consists only of the front half of a sole and its upper. The upper is made "to come up very high" and "terminates" at the sides in two eyelets, each fitted with two double "buttons," which serve as pivots for two elastic bands; these secure the overshoe to the foot by "being crossed one over the other behind the heels." The overshoe is lined or trimmed with fur or skin with the hair on.

[Printed, 4d. No Drawings.]

A.D. 1863, January 14.—No. 116.

PIDDING, WILLIAM.—(*Provisional protection only.*)—"Improvements in the soles and heels of boots and shoes, in studs, nails, tips, and toe or other plates used therewith, and in placing and securing them." The inner soles and heels are made of divisions of non-elastic material (perforated or not) with divisions of elastic material between them "to allow of their bending by the action of the wearer's feet." Some inner soles and heels are made entirely of perforated elastic or pliable material.

The outer soles and heels are made of perforated caoutchouc or other elastic material. The perforations admit of the insertion of studs, nails, tips, toe or other plates, which come into contact with the inner soles and heels. Sometimes the perforations are shaped to allow a space between the studs, &c. and the inner soles and heels. Sometimes only cavities are made in the outer soles and heels for the reception of the studs, &c.

The studs, &c. are made of "stone, metal, wood, bark, porcelain, stoneware, glass, papier maché, cement, plaster of Paris or any plastic material, concrete, shell, horn, bone, cork, leather, imitation leather, pith, resinous gum or any compound thereof." The studs, &c. have sometimes inserted in them nails, screws, &c. "to increase their durability;" sometimes they have projections on their under surface. The inventor mentions several ways of securing the studs, &c. to the outer soles and heels.

[Printed, 4d. No Drawings.]

A.D. 1863, January 28.—No. 246.

GEDGE, WILLIAM EDWARD.—(*A communication from Henry Chrétien Cordes and Leonard Wainschenck.*)—"Im-

"proved machinery or apparatus for fastening by screws "boots, shoes, and other articles composed of leather." Between the two back legs of a table is placed a lever mounted on an axle. A rod connects this lever to an upper lever "turning a gearing wheel and pinion which serve to direct "the operations." A crank handle may be placed on the vertical pinion axle or shaft which is set on a "spiral spring" and held by a "cap." In the bottom of the shaft is a tube and in the tube a piece of steel "cut chisel wise and forming "a notch which serves as a turn-screw." The head of the upper lever in its descent presses bearings against the shaft "and gears them"; they are drawn out of gear by two springs. The cap in its descent is arrested by two screws; in it is a guide "placed in a square hole and held by a pin." This guide "serves to regulate the screwing." Two small "balance "beams" form at their junction a cavity for the reception of the screw which is to enter the leather.

In the middle of the table is a hole wherein is placed the pivot of a block, which "is round and higher on one side in "order that it may be placed according to the requirements of "the work." In the last-carrier is a bolt "which draws by "means of a nut placed in the last." Two dovetailed slides or grooves "receive a wedge which serves to set the last on "one side or the other." If it is desired "to screw without a "last," a bickern which enters the boot or shoe and takes the required position is substituted for the block and last-carrier.

As additions to and modifications of the foregoing, a pedal may be applied; a chair for the workman may be adapted to the pedal; a hopper to contain the screws may be fixed above the operator; and some of the gearing may be dispensed with or differently arranged; these are all explained in the Specification.

[Printed, 10d. Drawing.]

A.D. 1863, February 18.—No. 448.

BOUSFIELD, GEORGE TOMLINSON.—(*A communication from Daniel Hayward.*)—"Improvements in the manufacture of "boots and shoes and in preparing india-rubber for such and "other uses." The uppers are of leather and the outer soles of vulcanized rubber. The rubber is vulcanized in a mould, within which is placed a wire forming a groove "in the tread

“ of the sole.” The groove serves as a guide for the sewing, nailing, or pegging; it also “throws the stitches so far “ beneath the bottom of the sole that the latter may be worn nearly through before the former are exposed to wear.” When nails or wooden pegs are used, the groove may be dispensed with if preferred.

A “heel stiffener” is made by spreading “any suitable “ compound of india-rubber” on cotton. Pieces of the required size are put into a mould and vulcanized, “the cloth “ being thrown upon the inside of the stiffener.” This stiffener is fastened on “in the ordinary manner.”

The prepared india-rubber is composed of ground-up “waste “ scraps and rags of cloth covered with unvulcanized rubber” and a mixture of fresh or crude rubber, plaster of Paris, litharge, whiting, and sulphur. The rags (about 1000 lbs.) are boiled for from 10 to 12 hours in ‘a mixture of 8 hds. of water and 75 lbs. of sulphuric acid, “the boiling being effected “ by means of copper steam pipes arranged in the bottom of “ a wooden tank.” The acid is removed by submitting the rags for from 3 to 6 hours to the action of steam under a pressure of from 75 to 125 lbs. The rags when dried are ground by means of heated rollers. The proportions of the other ingredients are about 8 lbs. of fresh rubber, 4 of plaster, 4 of litharge, 4 of whiting, and $\frac{1}{6}$ of sulphur. These ingredients are incorporated by grinding, and the ground rags and the composition are mixed in equal parts by weight and ground together.

[Printed, 10d. Drawing.]

A.D. 1863, March 19.—No. 734.

HASELTINE, GEORGE.—(*A communication from Henry Port.*)—“Improvements in the manufacture of boots and “ shoes.” The outer sole is of moulded india-rubber. The rivets for securing the sole to the upper and insole project “ from a continuous skeleton formed in accordance with its “ outline and incorporated within it.” The skeleton is cut with cross bars; it may be made in one or more pieces. “The “ edges of the sole are moulded with a feather edge or lip;” it should be “somewhat smaller than the bottom of the boot “ or shoe” so that it will “fit closely against the upper and

"be slightly extended," thereby forming a tight joint between the sole and the upper.

The heel is moulded with a recess which is filled with cork.

The shank is moulded with two tongues at its forward end; these are for the reception of a leather clump sole, which may be fastened on in the ordinary manner or as before-mentioned "with the skeleton portion of course on the outer side."

The last is of iron or of wood with a metal facing. Recesses are made "alternately on each side of the line corresponding "with the rivets extending around and across the sole," and they "enclose spring bolts with concave or cup-shaped ends" which clinch the points of the rivets in opposite directions. Projecting pins serve as guides for the punches (herein-after mentioned) and for the shank and heel piece.

Punches for making holes in the edges of the upper and insole are secured in a die by screws. Spring guides fit over the pins in the bottom of the last; they are retained in the die "by the overlapping heads of the screws." The die is fitted into a press by means of a handle.

A die for simultaneously cutting out and punching a clump or other sole of leather is fixed in a press by means of a handle. When the die is moved downwards, a plate first strikes the leather and holds it flat and firm, and then punches and a knife perforate it and cut it to the required shape. On the ascent of the die springs press the plate outwards and discharge the sole from the punches and the interior of the knife.

[Printed, 8d. Drawing.]

A.D. 1863, April 14.—No. 936.

KEATS, WILLIAM, and KEATS, JOHN.—"Improvements in the "manufacture of boots, shoes, or other coverings for the feet." The edge of the sole "has a strip cut from its under side all "round its edge." The edge of the upper is sewn to this thinned part, "the outer face of the upper being towards the "outer face of the sole." The upper and sole, "are then "turned inside out," and the boot or shoe is finished, "as "though the upper had been connected to the sole in the "usual way." The patentees prefer "to enlarge the strip by "cutting with a suitable tool a slit into the edge of the sole "just below the bottom or under side of the strip."

If a welt is used, the upper, the insole, and the welt are stitched together all round their edges, "the under side of the insole and the outer face of the upper "being at that time "towards each other, and the welt being between the two." The upper and the insole are then turned inside out, "thus "causing the welt to project outwards from them." The welt can then be sewn or otherwise attached to an outer sole.

"When thick leather is employed," the outer edges of the upper and insole are sewn together, "but in place of the welt "being introduced between the two," it is placed "above the "upper," so that when it is "turned over," an outer sole can be attached to it; a filling piece is inserted between the soles.

The heels are made and attached in the ordinary manner, and a heel stiffener may be inserted.

In order to cut off the strip, the sole is moved past two stationary knives, one of which forms the slit, the other a cut at right angles thereto. The edge of the sole is held against a stop projecting up from the table on which the sole rests; this stop carries the knife which makes the slit. A spring presses the sole down on the table, and "a revolving serrated "wheel" moves the sole forward past the knives.

[Printed, 10d. Drawing.]

A.D. 1863, April 21.—No. 988.

SIMPSON, EDWIN LINDSEY.—"An improvement in waterproof "compounds, and in fabrics prepared therewith." This compound may be applied to "hat bodies, bonnets, and for coating "wire for crinoline"; the fabrics "are peculiarly adapted for "the manufacture of clothing, boots, and shoes, and for all "articles where a waterproof quality is desirable." To prepare the compound, melt together over a slow fire 2 parts of gutta percha and 3 of camphine or naphtha, and set the mixture aside to settle and cool. For delicate tints, thin the mixture when partially cooled with camphine or naphtha. Prepare a drying oil by boiling linseed or other vegetable oil over a slow fire "until it attains the consistency of jelly"; when sufficiently cool, add to 4 gallons of the oil 1 ounce of purified benzene, 3 gallons of camphine or naphtha, and 3 gallons of the mixture. If a black colour is desired, mix lampblack in the oil; for other colours use the requisite colouring matter. Less camphine is

required when the compound is mixed "by grinding between
" iron rollers " than "by stirring or agitation."

The compound when "thoroughly cool or not above 70° " is applied to fabrics by any suitable means ; three coats are sufficient for ordinary cloths, two for silk or thin goods.

When the coats are thoroughly dried, they require a finishing coat or varnish composed of 1 gallon of drying oil and 4 ounces of red lead (or their equivalents) boiled together "until it will
" string two or three inches," with the addition of 1 quart of camphine or naphtha and 1 quart of the gutta percha mixture,
" when it has cooled sufficiently to allow it."

Fabrics thus prepared may have "a coating of flocks" applied to them while the varnish is in an adhesive state, or afterwards by softening the varnish with camphine or naphtha.

[Printed, 4d. No Drawings.]

A.D. 1863, April 22.—No. 1002.

BARLOW, HENRY BERNOULLI, — (*A communication from Jesse Follett.*)—(*Provisional protection only.*)—"Improve-
" ments in shoes, boots, and other coverings for the feet." These articles are rendered more durable by the application to the toes thereof of a plate or plates made of malleable cast iron or other metal or material. The plates form a sheath for the protection of the upper and the under leather. The sheath wrought or moulded into the desired form covers the upper leather at the toe, extends downwards over the outer sole, and passes over on the outer side thereof far enough to admit of being nailed on ; it has also "a central flange which
" passes between the outer and inner sole, extending back
" towards the heel."

[Printed, 4d. No Drawings.]

A.D. 1863, May 14.—No. 1211.

SATCHWELL, JOHN, ASHFORD, WILLIAM HENRY, and HARRISON, CORNELIUS, — (*Provisional protection only.*)—"Improvements in nails or rivets for boots and shoes, applicable to other purposes." These rivets are made "with a
" raised head and threaded shank"; they may be made of any kind of wire and of any required length and thickness. The raised head is generally of a spherical form, but it may be of any desired shape.

[Printed, 4d. No Drawings.]

A.D. 1863, May 15.—No. 1227.

PAPIN, JOSEPH, LINTZ, CHARLES, and LAVACHERIE, LÉON.—(*Provisional protection only.*)—"Improvements in "the manufacture of boots and shoes." The upper leather is cut larger than usual, "in such manner as to form a sole and "make by itself a supporter for the application of the other "soles."

Instead of the ordinary filling pieces, "a single piece of good "leather" is used for the insole; it is "inserted into and at "the same level with the prolonged upper leather."

In some cases a thin sole of india-rubber, gutta percha, or cork, is put between the inner and the outer sole.

[Printed, 4d. No Drawings.]

A.D. 1863, May 16.—No. 1229.

BROWNE, BENJAMIN.—(*A communication from Gustave Mayer.*)—"Improvements in the manufacture of elastic material." This material may be entirely elastic or partly elastic and partly rigid; it is intended to be used in the manufacture of boots and shoes and many other articles. "An important "feature in this invention consists in rendering articles manufactured with this improved material self-ventilating."

A die or plate is formed with holes or indentations therein, so that the material in the act of being made into sheets will have on the under side a series of points or projections. When the material thus formed is applied between the soles of boots and shoes, "the weight of the body and pressure of the feet "of the wearer will compress the series of points aforesaid and "produce elasticity."

To produce a material only partly elastic, the flat surface may be made very thin and be cemented to a flat piece of metal, wood, leather, or other suitable material.

[Printed, 6d. Drawing.]

A.D. 1863, May 18.—No. 1246.

TOY, SAMUEL.—(*Provisional protection only.*)—"Improvements in machinery for making screw rivets, nails, or pins," such as are used in joining the parts of boots, shoes, and other leather articles.

The inventor constructs the frame and nearly all the working parts of the machine "precisely as they are now built," but he employs (1) two or more sets of cutters "actuated simultaneously by the same levers, using a corresponding number of set pins"; (2) a corresponding number of dies for pressing the rivets, &c.; (3) two or more punches for forming the heads.

The dies are "all worked from one lever." The cutters and dies are "all fixed upon one plate." The punches "are fixed on a slide formed to suit the different centres of the several dies and cutters." The heading (when heads are required) and the cutting off are performed at one revolution of the machine.

By the foregoing arrangement two or more rivets, &c., are produced by each revolution.

[Printed, 4d. No Drawings.]

A.D. 1863, May 23.—No. 1298.

HOEY, WILLIAM. — (*Provisional protection only.*) — "The preparation of a fluid for removing the surface of japanned and enamelled leathers and cloths." This fluid is applicable for boots, shoes, and harness; it is composed of about 2 ounces of paraffine or rock oil, or a mixture of both in any proportion, $\frac{1}{4}$ of a drachm of oil of lavender, $\frac{1}{4}$ of a drachm of "citronel" essence, and $\frac{1}{2}$ of an ounce of spirit of ammonia; sometimes ivory or lampblack is added to colour the mixture. When the ingredients are thoroughly mixed together, the fluid is applied lightly on the surface of the leather or cloth.

[Printed, 4d. No Drawings.]

A.D. 1863, June 2.—No. 1373.

ILLINGWORTH, ABRAHAM. — "Improvements in boots and shoes or similar coverings for the feet and in the manufacture thereof." A wooden sole or a layer of wood is introduced between the insole and the outer sole. By preference this sole extends only to the waist; it is tapered off to a thin end, so that the outer sole may overlap it.

In some cases a thin piece of leather "to have the appearance of a welt" is placed between the insole and the wood.

Sometimes the outer sole does not cover the whole surface of the wood; a space is left round the outer edge for strips of iron, gutta percha, or other suitable material.

The various parts are nailed or riveted together upon an iron last.

The heels may be of wood with an outer piece of leather.

[Printed, 4d. No Drawings.]

A.D. 1863, June 8.—No. 1417.

SCHOFIELD, EDWIN ARTHUR. — (*Provisional protection only.*)—“Improvements in tools or apparatus for paring, “rasping, and scraping the edges of boot and shoe soles and “heels.” These operations are performed at one and the same time. Fast and loose pulleys are fitted upon the middle of a spindle which revolves in bearings in two uprights. Upon the ends of the spindle “beyond the uprights” there is fixed by nut and screw or otherwise “a tool consisting of a “toothed wheel, the teeth of which are formed with cutting “edges.” Guards in the shape of discs are placed at one or both sides of the wheel. The shape of the wheel “varies “according to the work to be performed,” military heels requiring one shape, soles of low-heeled boots and shoes another. The guard on one side may be dispensed with for the soles of “pegged, riveted, and screw work,” while a guard on each side should be used “for ordinary sewn and stitched work.” Motion may be communicated from any prime mover, and the work is presented to the tool by the workman.

[Printed, 4d. No Drawings.]

A.D. 1863, June 23.—No. 1576.

STOCKER, ALEXANDER RICHMOND. —“Improvements in pre-
“paring and fashioning iron applicable to the manufacture of
“boot heels, tips, and horse shoes, and in part of the machinery
“or apparatus to be employed therein.” The patentee claims
“the employment of close grooved rolls in the formation of iron
“for the manufacture of boot heels and tips.” The upper set
of rollers are made “on the centre of that part of the surface
“intended to act upon the rod or bar with an annular pro-
“jection”; this produces “a deep channel along the centre
“of the rod or bar while passing through the rolls.” The

thin web at the bottom of the channel is afterwards cut by a pair of circular cutters, and thus are formed from one bar two ready for cutting-up into lengths for tips. The rods or bars may be cut into lengths for tips before they are passed between the rollers.

One of the rollers is formed on each side of the projection "with a number of projecting countersinks"; these produce "perfect countersinks intended for the reception of the nail heads as well as at one and the same time producing the channel or groove."

The cut lengths are bent into shape "by any present well-known bending contrivance."

The mounting of the rollers and of the sliding table for the carriage of the rods or bars, and the mechanism employed (as well as the working of the whole) will be found described in the Specification.

In describing his method of making hind horse-shoes the patentee informs us that the toe is "completely steeled," or "left with a projecting piece which can be turned up, and that the same is applicable to the shaping of toe tips.

[Printed, 1s. 4d. Drawings.]

A.D. 1863, July 1.—No. 1635.

SNELL, WILLIAM.—(*A communication from Jules Wiese.*)—(*Provisional protection only.*)—"An improved waterproof material," useful in the manufacture of boots and shoes and for many other purposes in which "resistance to moisture and changes of temperature, elasticity, durability, cheapness, and facility of renovation are considerations."

The material is called "elastic fibrine"; it is composed of gutta percha, new or waste caoutchouc, or any other kind of elastic gummy matter, mixed with hair, wool, flax, hemp, cotton, or other fibrous matter, in various proportions, and moulded into shape.

[Printed, 4d. No Drawings.]

A.D. 1863, July 1.—No. 1642.

HUTCHINSON, HIRAM.—"Improvements in boots and shoes." The uppers are made of india-rubber or gutta percha or a combination of the two; some are made of leather or cloth or other substances.

The insoles are of leather, india-rubber, or "any convenient materials."

The outer soles are "of leather alone, or leather and india-rubber combined, or leather, india-rubber, and wood combined," or india-rubber and gutta percha combined or separate; they are attached by nailing or sewing or by both processes.

The patentee claims also "the adding a wooden heel to boots and shoes made of leather and with a leather sole."

[Printed, 4d. No Drawings.]

A.D. 1863, July 3.—No. 1656.

BAULCH, CHARLES.—"Improvements in the manufacture of boots and shoes." The outer sole is united to the upper leather by means of metallic tacks or pegs, the heads of which "are inserted from and lie inside the boot or shoe when finished," while the points "are all directed outwards from the inside."

The sole leather is well wetted, and both upper and sole are lasted inside out. For security's sake a strip of leather or other substance is applied over the edge of the upper, and the tacks are driven through the strip and upper into the sole. When the sole and upper are turned back to their proper position, an insole is inserted, and the heel is put on in the usual manner.

The tacks are made with smooth and broad heads and with one or both sides barbed.

[Printed, 8d. Drawing.]

A.D. 1863, July 8.—No. 1700.

TALLERMAN, REBECCA, and TALLERMAN, LEWIS ABRAHAM.—(*Provisional protection only*).—"A new method of waterproofing and ventilating boots, shoes, and slippers, for preventing wet and damp feet." Two pieces of oiled silk or oiled cloth are inserted between the lining and the outer material; one piece reaches "from a little below the centre of the boot to the bottom," the other "from the top of the boot to about three-fourths of an inch over the top of the former piece." To prevent the pieces from sticking to each other "a narrow strip of binding or lining is put between them."

The bottom is waterproofed, "by a socking of the ordinary materials" washed at the side next the sole with india-rubber solution which causes it to adhere thereto. The socking, "being cut a little wider all round is made to cover the weakest point of the boot, namely, where the upper is stitched to the sole." Ventilation is given by means of "two eyelets placed in the waists of the boots leading to the sole" and two eyelets "just above them in the upper leading to the outer material, against which the foot presses."

[Printed, 4d. No Drawings.]

A.D. 1863, July 10.—No. 1725.

LEGG, THOMAS, and GRIFFITH, RICHARD.—(*Provisional protection only.*)—"Improvements in the construction of "sewing machines," intended to be used for sewing up the seams of "tubular articles, such as boots, shoes, sleeves," &c. The machines belong to that class "wherein both needle and "shuttle threads are employed."

The position of the shuttle box is such that "the shuttle moves to and fro in the same direction as the work, i.e., "parallel thereto." The shuttle box is affixed to the bed of the machine "at right angles to the arm and apparatus for "actuating the needle and propeller foot."

The shuttle is actuated in the following manner:—"On the "end of the driving axis, and in a line with the end of the "box on which the shuttle works" is fixed a crank or cam surface, "which by a connecting rod actuates a slotted plate "or frame; and by a pin or stud on a rod or arm attached to "the shuttle entering a curved or inclined slot in the plate "or frame a to-and-fro movement is communicated to the "shuttle, which is caused to 'dwell' at suitable intervals by "altering the direction of the slot at each end thereof."

On each side of the shuttle box an opening is left in the table which supports the bed of the machine, "so that when "the seams of tubular articles are being sewn up, they may "be passed over or around the shuttle box which projects "from the back of the table, towards the front of the machine, "the parts or edges of the material to be sewn together "resting on the upper surface of the shuttle box."

When the machine is not required for sewing up tubular articles, the openings may be closed up with a sliding piece, which "by embracing the shuttle box forms a flat surface of some extent, which serves as a table for ordinary work, the surface of which is flush with the upper surface of the shuttle box."

[Printed, 4d. No Drawings.]

A.D. 1863, July 16.—No. 1783.

PRIESTLEY, LISTER, and TODD, JOSEPH LONGLEY.—(*Provisional protection only.*)—"Improvements in the manufacture of elastic boots and shoes, and in apparatus used therefor." The first improvement consists in securing the elastic webbing between the leather and the lining by means of "small eyelets" and rivets composed of brass or other suitable material, thereby combining strength of attachment, ventilation, and easiness of renewal.

The second improvement consists in the instrument used for punching the eyelet holes and clinching the eyelets. The instrument is "a hand lever clencher and hand lever punch" having long jaws, so that the holes may be punched and the eyelets be clinched "in the lowest part of the boot required as well as the intermediate parts." The rivets are secured "in the usual manner."

[Printed, 4d. No Drawings.]

A.D. 1863, July 20.—No. 1808.

SIMPSON, WILLIAM, and HUTTON, JOHN.—"Improvements in the manufacture of hollow cutting tools." The improvement consists in casting instead of forging such tools as punches for cutting out paper, linen, leather, and other substances required by envelope makers, shoemakers, and others.

One of the methods used by the patentee for making a pattern consists in running lead into a mould of an angular form "in strips of about three feet long," one side "being of the bevel to be given to the cutter." These strips are bent into the shape of the required cutter, and are then "moulded in sand or loam in the usual manner either with or without a chill." Highly carbonized iron, holding 50 per cent. of carbon, is melted in a crucible with black oxide of manganese, rock salt,

and powdered clay, in the proportion of about 10 lbs. of the mixture to 1 cwt. of iron. The crucible luted air-tight is put into a furnace and kept therein until the iron is thoroughly melted and decarbonized; the iron is then poured into the mould and left to cool. The tool after being taken from the mould is annealed until it acquires the proper temper, after which it is ground and finished to a sharp cutting edge.

[Printed, 4d. Woodcut.]

A.D. 1863, July 31.—No. 1898.

DICKSON, JOHN FARMERLEY. — (*Provisional protection only.*)—"Improvements in the manufacture of boots and shoes." The soles are united to the uppers with metal rivets, and the improvement consists in concealing the heads of the rivets.

First method:—The sole is grooved "where the line of rivets is to come;" the heads of the rivets are driven in to the bottom of the groove, and the groove "is closed by means of a heated iron."

Second method:—The rivets are driven into the sole "at an angle" so that their heads "may come close up to the edge thereof;" they are driven "somewhat below the surface of the sole," and their heads are concealed "by passing a hot iron round the edge of the sole."

Third method:—The sole is split all round the edge, so that a thin strip may be turned back; when the rivets are driven in and clinched, the strip is turned back again and "cemented down to the sole so as to cover the heads."

[Printed, 4d. No Drawings.]

A.D. 1863, August 15.—No. 2034.

BOUSFIELD, GEORGE TOMLINSON. — (*A communication from Samuel Hilton.*)—"Improvements in the manufacture of cement." As this cement is "perfectly insoluble in either water or oil," it is especially adapted for belts or bands which are to be used in a damp place, and for fastening together the pieces of leather which compose the sole of a boot or shoe.

The cement is made from gelatine and tannin in the proportion of 3 lbs. of gelatine to 1 lb. of tannin. Dissolve the

gelatine in about 1 gallon of water at a temperature of 212° Fahr. Dissolve (in a separate vessel) the tannin in half a gallon of alcohol at the ordinary temperature of the atmosphere. Throw the two solutions together, and let them stand until cold, when the gelatine and tannin will have "combined" in the form of a thick viscid precipitate." Heat the mass over a slow fire to about 106° Fahr., until the water and alcohol are thrown off by evaporation; stirring during this process effects a separation of the solvents, "modifies the character of the composition," and causes a thorough combination of the ingredients. "If a more complete union of the elements is thought advisable," add to the mixture after the last process 1 lb. of vinegar and 1 lb. of alcohol for each lb. of the composition, and "boil until the mass is homogeneous and of the consistency desired."

The best method of applying the cement is to raise it to the boiling point, spread it upon the surfaces to be united, and confine them under pressure until the cement is cold.

[Printed, 4d. No Drawings.]

A.D. 1863, August 19.—No. 2057.

JACKSON, WILLIAM.—"Improved arrangements of the parts in sewing machines for using shoemakers' wax thread suitable for heavy boots or other leatherwork to which it may be applied." In this machine one thread only is used producing the chain stitch." The hooked needle works from below. The needle bar is pierced with a pin, the right-hand end of which carries a roller "for running in the groove of the face cam," while the other end has on it a screw nut for fixing it in the needle bar and also for giving motion to the looper bar by forcing it up and down" by a tappet piece. At the top of the looper bar there is "a cranked arm with an upright conical piece" which is pierced with a hole to slide up and down outside the hooked needle, and is for the purpose of opening and preventing a loop when made from being caught by the hook of the needle when it is descending from the material with a succeeding loop."

The thread is wound on a reel "having the necessary tension to tighten the stitch;" one end, passing over a roller or through a hole at the front end of the machine and through a

hole in the end of a rotating thread arm, is placed under the presser foot (the material being also under the foot); the needle "is forced upwards through the material to its highest position, "when the thread arm carries the thread from right to left, and "it enters the hook of the needle." At this moment the foot is lifted; the needle is partially drawn down having the loop of thread in the hook; "the pressure of the foot is again "resumed on it and is ready to advance the material for "another stitch." When the needle bar has descended so far that the pin with its nut is come into contact with the lower part of the tappet piece, the needle bar and the looper bar descend together, "the loop of thread being then within the "top of the conical piece." The needle bar ascends, "leaving "the looper bar and loop behind stationary; when the pin comes into contact with the upper part of the tappet piece, both bars will ascend together; the conical piece "will occupy "the inside of the loop;" and when the next loop is brought down by the hook into the top of the conical piece "the hook "is protected so that the former loop cannot be caught by "the hook, the needle drawing the loop tight at the completion "of its descent."

[Printed, 1s. Drawings.]

A.D. 1863, September 4.—No. 2183.

THORNHILL, CHARLES.—(*Provisional protection only.*)—

"A new or improved method of adapting steel or other suitable "metallic wire to be used instead of animal bristles or hair in "sewing boots, shoes, saddlery, and leather works generally." This metallic substitute for bristles is made either with or without tails.

In the former case a piece of wire of from 8 to 12 inches in length is bent "double about the middle;" the one portion is twisted close round the other for a length of from 2 to 4 inches, leaving the untwisted parts "like two tails," to which the sewing thread can be attached as to split bristle. When the wire has been twisted, it is to be tempered (if of steel wire) so that its elasticity may be "somewhat similar to that of a hog's "bristle."

In the latter case a piece of (by preference) steel wire of from 4 to 7 inches in length is used; one end (from 2 to 4

inches long) is flattened, twisted into a spiral thread, and tempered. The sewing thread is attached to the twisted end.

[Printed, 4d. No Drawings.]

A.D. 1863, September 24.—No. 2352.

MARSHALL, THOMAS and MARSHALL, WILLIAM.—“Metallic instruments to be used as substitutes for bristles in sewing, stitching, closing, and otherwise joining boots and shoes and other leather work.” The instruments are made (by preference) of steel wire; the solid part, which represents the unsplit portion of a bristle, is “tempered to a spring of moderate temper;” the tails are “comparatively soft” so as to admit of their being “twisted with and amongst the fibres of which a wax end is composed.”

The instruments may be made in either of the following ways :—(1) A piece of wire is bent at the middle of its length and twisted for a suitable distance; the twisted portion is tempered, whilst the ends are left soft for the purpose of being twisted with the fibres of the sewing thread. If the class of work will allow of the use of a thicker wire, one end of the wire is split; the solid portion is tempered, and the split portion is left soft.

(2.) The solid part is made with an eye or eyes grooved as in an ordinary needle. The tails are formed of a separate wire passed through the eye or eyes. If only one eye is pierced in the solid part, the portion immediately above the eye should be “slightly curled or twisted into a spiral form.” The solid part is to be tempered, and the tails to be left soft as before.

In each case the upper end of the solid part should be pointed.

[Printed, 4d. No Drawings.]

A.D. 1863, September 24.—No. 2361.

BONNEVILLE, HENRI ADRIEN.—(*A communication from Toussaint Landrin.*)—(*Provisional protection only.*)—“Improvements in joining leather” for “harness, driving bands, boots and shoes, and all other uses.” The joint is hidden “completely or partially at will” by combining “a gluing process” with sewing or with screws or rivets.

The two pieces to be joined are slit longitudinally at each side, leaving the portions through which the threads, screws, or rivets are to pass a little thicker than the others. The thinner portions are lifted up; the thicker portions are joined together; the thinner ones are turned down and cemented on; and strong pressure is applied to the whole.

[Printed, 4d. No Drawings.]

A.D. 1863, September 25.—No. 2362.

DE WAILLY, CLEMENCE.—(*Provisional protection only.*)—"An improved slipper or clog principally intended for bath rooms." These slippers preserve their shape and size even after repeated washing and drying "owing to the strict exclusion of all animal substances in their construction." They are made of thin plates of straw, cane, cocoa nut or Mexican fibre, or other vegetable substance not damageable by water. The plaits are joined together in the same manner as the Tuscan straws and are shaped on a last, "but always without quarter at the heels."

[Printed 4d., No Drawings.]

A.D. 1863, September 28.—No. 2382.

JOHNSON, JOHN HENRY.—(*A communication from the American Shoe Tip Company.*)—"Improvements in the manufacture of boot and shoe toe pieces or tips and in the machinery or apparatus employed therein." The framework consists of a platform and two uprights thereon united near or at their tops by a cross-piece. A block secured to the uprights supports a die holder, which is a quadrangular cast-iron casing open at top and having through each side an adjusting screw. A plunger slides freely up and down on ways along the uprights, and to it is adjusted by means of a dovetail joint and ledge a follower, whose lower end is shaped in accordance with the interior of the tip to be made. The die is a solid metal casting; its cavity is shaped to conform with the outside of the tip and is so disposed that both sides correspond to the underside thereof. The top of the die "should be bevelled forming an angle with the plane of motion" of the follower of about 40°. Upon the face of the die is fixed by screws a gauge to hold the metal blank in position. The gauge is "a plate having a slot cut through it

“ of such a shape as to fit nicely the convex side of the tip
“ blank ;” it is so adjusted “ that the part which is to form
“ the portion of the tip that extends over the toe of the shoe
“ or boot shall lap over and extend beyond the cavity in the
“ die.” If the machine is worked by hand, a handle is
connected to the plunger. When the plunger is raised to a
convenient height, the handle is held wedged in a tapering
slot while the blank is being fitted into the gauge.

[Printed, 8d. Drawing.]

A.D. 1863, September 29.—No. 2389.

CLARK, WILLIAM. — (*A communication from Theodore Gustav Eiswald.*)—“ An improvement in the soles of boots
“ and shoes.” As a protection to the sole, the inventor attaches
thereto a metallic plate by means of nails of such length that
they pass through the sole and the edges of the upper or the
welt and are clinched upon an iron last. Thus the nails serve
the purpose of fastening the plate to the sole and the sole to
the upper.

The plate is of wrought or cast iron ; it corresponds with the
form of the sole ; it is provided with nails all round its edge ;
its outer face may be made with projections or corrugations to
prevent slipping and with perforations to reduce the noise
made in walking ; it is fixed on by pressure in any suitable
press.

Heel plates may be applied in a similar manner.

[Printed, 6d. Drawing.]

A.D. 1863, October 1.—No. 2411.

ANDERTON, JAMES JOHN. — (*Provisional protection not
allowed.*)—“ Improvements in the manufacture of boots and
“ shoes.” The inventor proposes to employ an “ improved
“ machine ” for uniting upper leathers and soles by means of
wooden or metal pegs. No description of the machine is
given.

[Printed, 4d. No Drawings.]

A.D. 1863, October 3.—No. 2426.

FAGG, THOMAS and FAGG, JESSE. — (*Provisional protection
only.*)—“ Improvements in the manufacture of boots and
“ shoes.” The object of the inventors is “ to dispense with

“ the seam across the joint of the foot and also with the seam
“ in the front of the boot along the instep.”

The upper consists of one piece of leather blocked and
“ closed only at the back with one vertical seam.” Sometimes
two pieces are used, one being let in as a gusset. The lace
opening is made “ in a curvilinear line on the outer side of the
“ boot and between the line of the instep or centre of the boot
“ and the ankle joint ;” but if desired it may be made in the
ordinary manner in the middle of the upper. The tongue consists
of “ an extension of the leather lining,” which is cut of the
same size as the interior of the boot and “ is attached at the
“ inner side of the curvilinear opening at a short distance
“ beyond the eyelet holes.”

[Printed, 4d. No Drawings.]

A.D. 1863, October 12.—No. 2505.

ANDERTON, JAMES JOHN.—“ Improvements in machinery for
“ cutting and finishing the edges of the soles and heels and
“ the bottom of boots and shoes.” For the purpose of cutting
the edges of soles and at the same time cutting or rasping
off the wooden pegs from the bottoms a circular cutter is used ;
it carries a series of knives “ placed obliquely to its axis ;”
it has also on its circumference an upper and a lower flange,
the upper one being provided with small knives which cut
smooth “ the upper edge of the welts,” the lower one with
knives which “ clean off wooden pegs from the bottoms.” If
the sole is attached with metal pegs, “ they are cleaned off by
“ means of a file roller,” and the lower flange is “ perfectly
“ plain and smooth.”

For “ glazing and hardening the edges of the soles,” a revolving circular disc is used ; its circumference is perfectly smooth and has a smooth flange at its upper and lower edge.

For cutting the edges of heels the cutter is “ of a somewhat
“ conical form,” of greater thickness at its edge and without
flanges. The disc for glazing and hardening the edges is also
somewhat conical in form ; its circumference is perfectly
smooth, and it carries a smooth flange on its upper edge
only.

The cutters and discs are of various widths at the circumference according to the thickness of the soles or heels to be operated upon ; they are mounted horizontally upon a vertical

spindle and revolve by hand or other power upon the surface of a table.

[Printed, 4d. No Drawings.]

A.D. 1863, October 15.—No. 2529.

WEATHERDON, BALDWIN FULFORD—"A new apparatus for "rubbing off or removing the dust or dirt from boots or "shoes." This apparatus is intended to stand in the halls of houses, either independently or attached to an umbrella stand or other article; it will enable persons "to remove any dust or "dirt from the fronts of their boots or shoes whilst on the "feet."

The apparatus is composed of (1) a base containing a drawer for the reception of the dust or dirt; (2) a foot-rest bolted to the base; (3) a conical brush frame "formed with projecting "prongs radiating from the axis upon which the same moves;" (4) brushes secured to the prongs; (5) "multiplying toothed "wheel gear and winch handle or lever motion within fixed "bearings" for communicating motion to the brush frame; (6) an outer case with a circular opening therein for the reception of the boot or shoe.

The foot is inserted through the opening and placed on the rest; the brushes are caused "to revolve sharply over the "instep and around the fore part of the boot or shoe alternately from one side to the other" either by moving the handle or by the downward pressure of the foot, according to the arrangement employed.

"The form and arrangement of the brushes and brush frame, "together with the mode of actuating and working the same," may be modified.

[Printed, 8d. Drawing.]

A.D. 1863, October 19.—No. 2553.

GILBEE, HENRY.—(*A communication from Louis Poncelet.*)—"An improved composition for rendering boots and shoes "and other similar articles waterproof." The composition is made by boiling 2 lbs. of common tallow, adding thereto 2 ounces of yellow beeswax (cut into small pieces), boiling the two together, then adding 2 ounces of olive oil, again boiling the mixture and adding thereto 4 ounces of tar; the whole must

finally be boiled and well stirred together. The composition is to be applied in a lukewarm state.

In order to "insure perfect success" in using the composition the patentee describes his mode of manufacturing boots or shoes:—He cuts in the first sole "a deeper and wider groove than usual;" he coats the outer surface of this sole with the composition and lays-on a cork sole; he coats the outer surface of the cork sole, and puts thereon the outer sole, on the outer surface of which he makes a groove for the reception of brass rivets. "The upper leather, heels, and any other parts, as well as the stitches," receive a coating of the composition.

[Printed, 4d. No Drawings.]

A.D. 1863, October 20.—No. 2570.

BARLOW, HENRY BERNOULLI.—(*A communication from Jesse Follett.*)—(*Provisional protection only.*)—"Improve-ments in shoes, boots, and other coverings for the feet." The inventor renders these articles more durable by the application to the toes thereof of a plate "of a peculiar form made of malleable cast iron or other metal or material." The plate forms a sheath for the protection of both the upper leather and the sole at the toe; it is wrought or moulded into such form that it covers the upper leather at the toe, extends downwards over the outer sole sufficiently to receive the nails which fasten it on, and has "a central flange which passes between the outer and inner sole extending back towards the heel."

[Printed, 4d. No Drawings.]

A.D. 1863, October 27.—No. 2651.

GRASON, THOMAS.—"Improvements in boots, shoes, clogs, and such like coverings for the feet." The "chief feature" of this invention is the use of "key ribs instead of stitching, pegging, or screwing" as a means of attaching soles and heels to the uppers of boots, shoes, &c.

The ribs may be **V** or **T**-shaped, circular, or of any shape "which will form a sliding key;" they may be made of the leather composing the outer sole, or of metal or other material secured to the outer sole; corresponding grooves are formed in the leather of the inner sole, or metal grooves are fixed therein. The ribs are slid into the grooves, and both are

“keyed together” by means of spring latches or other convenient fasteners. Heels are made and fastened on in like manner. When metal is used, a washer of leather or other substance may be inserted “forming a better connection “between the two plates, also preventing any unpleasant “clinking or knocking of the plates together,” an arrangement “principally confined to the heel.”

Sometimes the outer sole and heel are attached to the inner sole “by means of a single plate” made with projections which are inserted into recesses in the insole; the attachment is effected “from the inner side of such plate” by pins or staples which pass through the projections; sometimes by T-headed screws, whose heads “project at right angles to the “recesses” formed for their insertion in the inner sole; sometimes by “sliding within circular grooves” pieces of metal or other material threaded for the reception of “pegs, “spikes, or nuts,” giving thereby the appearance of soles or heels “having nails driven in from the outer side.”

Sometimes the patentee uses “a split hollow screw” instead of “the countersunk screw now employed for retaining the “soles of boots and shoes;” the hollow portion is filled up with leather, wood, &c., “which can be readily withdrawn,” and “any remaining portion of such screws can be easily “extracted.”

“Several arrangements which have been found practicable” are illustrated in the sheet of drawings as well as explained in the Specification.

[Printed, 10*l*. Drawing.]

A.D. 1863, November 6.—No. 2755.

SOUTHALL, CHARLES HENRY, and HEAP, ROBERT.—“Im-
“provements in self-acting machinery or apparatus worked by
“steam or other power for cutting and shaping the soles and
“heels of boots and shoes and screwing them on to the uppers
“or coverings, and also in vices for holding the same, and
“tools for paring, blacking, and glazing or otherwise orna-
“menting the edges of the soles and heels.” These several
operations may be performed in one machine, or one machine
may be used for cutting the soles, another for screwing the
soles and heels to the uppers, and another for paring and
finishing. The patentees describe one machine which performs
all the operations,

The soles are cut out on a removable table "having centres;" above it is a template held fast by screws or a lever and pressed down by a cam. The template "forms the guide for the tool, " which cuts the leather beyond the template."

The screws are made from a coil of wire placed on a drum at the top of the machine; the wire is threaded by cutters or dies in a holder and is forced into the sole "without any hole " having been previously made;" the length of the screws is regulated by change wheels. When the screw has penetrated the required depth, the spindle containing the wire is made to stop; the wire is cut by self-acting shears, and the boot or shoe is moved by a ratchet wheel one tooth or more as desired. The screwing begins at one side of the sole close to the heel; it continues onwards round the toe and the other side, after which the heel is screwed on.

In using this machine "the first and principal thing is the " holding of the boot firmly;" for this purpose "two peculiar " vices, one for the sole part and the other for the heel " part" are employed; each is described at length in the Specification.

When the screwing is completed, "the vice containing the " boot is removed to another portion of the machine" for the purpose of finishing the edges, &c. The tools "have to-and-fro motion sideways imparted to them;" they are made of brass or other metal with steel cutters "and are arranged somewhat similar to a joiner's plane but are made to swivel " universally to suit the various curves of the boot sole." The tools for blacking and glazing are jointed to a crank holder " and work up and down and to and fro in the same manner " as the cutting and paring tools." As it is not convenient to finish the fore part and the heel at the same time, "the tools " are made to traverse the edge of the boot sole from one " corner of the heel to the other and then return."

This machine consists of so many parts that the reader must refer to the Specification for a full description of each part and its arrangement.

[Printed, 1s. 4d. Drawings.]

A.D. 1863, November 10.—No. 2789.

YATES, GEORGE.—"Improvements in machinery to be used " in the manufacture of heel tips and toe tips and toe plates

“for boots and shoes.” Two machines are described, the one for shaping iron into tips and toe plates, the other for polishing them.

1. An upper and a lower roller are mounted on parallel axles which are geared together. “A reciprocating motion or a “backward and forward motion of partial rotation” is communicated to the rollers. The lower roller is provided with collars, one of which is conical; the upper one has a conical projection which engages between the collars. “The figures “of the acting parts” of the rollers are such as to convert strips of iron into “the figure employed in making heel tips “and toe tips.” The cylindrical part of the lower roller has fixed in it projecting pieces “which produce the required “countersinks,” and either roller carries a projecting stop which “limits the distance to which the iron to be operated “upon can be introduced” between the rollers. The roller are adjustable as to distance from each other. When strips for tips have been operated upon by the machine, “they are bent “into the required form in the ordinary way.” The rollers for countersinking and shaping toe plates have “two sets of “countersinking pegs”; the plates after countersinking “are “cut when necessary into the required shape.” Modifications of the gearing are described.

2. Two shafts, “capable of rising and falling vertically,” and also “capable of a slow rotatory motion,” have their sum-mits shaped to hold securely the tips or plates which may be dropped thereon. Above the shafts rotates a horizontal shaft carrying at each end a polisher, “consisting of a short cylinder “with a conical flange.” The cylindrical and conical faces of the polishers are cut into fine teeth; or instead of using metallic polishers, wood covered with leather and emery or other polishing material may be employed. The polishers have a sliding motion also on the shaft. The tip or plate is pressed against the polisher, the flat surface being brought against the cylindrical face and the outer edge against the flange. The gearing of this machine is fully explained.

[Printed, 1s. 6d. Drawings.]

A.D. 1863, December 7.—No. 3068.

SIMPSON, JOHN HAWKINS.—(*Provisional protection only.*)—
“Improvements in the manufacture of boots and shoes.” The

first improvement consists of "a seamless metal toe sheath," which may be affixed to the boot or shoe when finished. The upper part is perforated to make it more pliable and ornamental; the edge has a bead to prevent its cutting the upper leather; and the lower part "comes under and crosses the "sole" to which it is nailed or screwed.

The second consists of a similarly formed sheath to be placed inside the toe of the boot or shoe for the purpose of preserving the shape thereof.

The third consists of a metal heel piece filled with leather or other substance. The wall of the case may have "an external "flange at the lower edge so as to protect the heel underneath"; or the interior "may be made thicker in parts so "as to form internal ribs in a vertical direction."

The fourth consists of a metal stiffener for the upper leather surrounding the heel and inserted between the outer leather and the lining. The lower part "extends either entirely or in "part underneath the heel and is prolonged under the instep "so as to support the waist."

[Printed, 4d. No Drawings.]

A. D. 1863, December 12.—No. 3141.

JOHNSON, JOHN HENRY.—(*A communication from Charles Mac Burney.*)—(*Provisional protection only.*)—"Improvements in the construction and mode of attaching of india-rubber and other composition soles to boots and shoes, or to the uppers thereof." These soles are to be attached "by mechanical means in lieu of by cement," for which purpose they are perforated with holes for nails, pegs, or other mechanical devices, before they are vulcanized.

Some soles have "rivets or other clinching devices" partly imbedded therein; others have a groove formed in them "for containing the thread employed in attaching" them.

In some it is proposed to have imbedded in them canvas, strips of metal, or woven wire, for the double purpose of increasing their strength and enabling them to be fastened on "without having holes previously made therein."

[Printed, 4d. No Drawings.]

A. D. 1863, December 14.—No. 3150.

STEWART, CHARLES.—(*Provisional protection only.*)—"Improvements in making boots and shoes." The inventor makes

his boots and shoes "in a more economical and durable manner, "and so as to be more comfortable to the wearer," by attaching the welt to the upper leather by means of plain or screwed rivets or pegs, and by then securing the sole to the welt with cement or sewing or both combined.

[Printed, 4d. No Drawings.]

A.D. 1863, December 18.—No. 3198.

BONNEVILLE, HENRI ADRIEN.—(*A communication from Pierre Dominique Lacroix.*)—"Improvements in the manufacture of socks" or "moveable inner soles." A sheet of cardboard, or leather, or other suitable substance, is cut to the desired shape, and to it is sewn or otherwise attached a layer of curled horsehair. If preferred, the stitches may be hidden and the sock be strengthened by the addition of a piece of leather or other material.

The horsehair may be used in different ways; two soles may be united at the edges, leaving an opening at the ends or sides for the introduction of the horsehair, so that it may be taken out, opened out, and replaced when required; or it may be "otherwise woven or agglomerated and employed either "separately or combined with the materials above described "or others."

[Printed, 4d. No Drawings.]

A.D. 1863, December 23.—No. 3242.

JOHNSON, JOHN HENRY.—(*A communication from Horace Bearce.*)—"Improvements in shields or tips for boots and "shoes." This shield may be made of sheet or cast metal, fusible alloy, hard india-rubber, gutta percha, or other suitable material, either by means of swages and dies or other stamping mechanism, or by casting or shaping in a mould. The shield consists of "a raised curved part" which fits over the toe, of "a base plate" which fits externally on to the sole and is fastened thereto by nails, rivets, or screws, and in some cases of "a depression or indent" round the front, "which fits into "and marks the junction of the sole with the upper leather."

[Printed, 6d. Drawing.]

A.D. 1863, December 23.—No. 3256.

JOHNSON, JOHN HENRY.—(*A communication from Horace Bearce.*)—"Improvements in shields or tips for boots and

"shoes." This shield consists of three parts; (1) a raised curved part which fits over the upper leather of the toe, (2) a "central flange or plate" fitting in between the upper leather and the sole and serving to keep the shield more securely in its place, and (3) a plate which fits externally on to the sole so as to completely cover the toe thereof. The shield is fastened on by screws, nails, or rivets, holes being made in the flange or in the plate or in both.

The shield may be made of metal or alloy or of hard india-rubber, gutta percha, or other plastic material, by means of casting or swaging or moulding. When the shield is made of thin metal plates by swaging, the portion which covers over the upper leather "will be of two thicknesses of the said plate," and "below that one portion or thickness forms the flange."

[Printed, 6d. Drawing.]

1864.

A.D. 1864, January 4.—No. 25.

JOHNSON, JOHN HENRY.—(*A communication from Isidore Sollier and Baron Gerard Dedel.*)—(*Provisional protection only.*)—"Improvements in sewing machines," which are "intended for boot and shoe work, harness work, and the stitching of leather and strong materials generally." A horn which supports the material is carried by an arm free to turn round a pivot in the bed plate, so that the material may be readily turned in any desired direction. The arm contains a thread bobbin or reel, a tension apparatus, and "a compartment for containing a small lamp or gas jet for heating the horn." The upper end of the horn carries a "thread distributor." The main driving shaft, contained within an "overhanging bracket," carries at its front end a slotted disc in which a slide works, "the course of which is variable in order to regulate the stitches." The disc "imparts motion to the principal pieces of mechanism in the head of the machine" by means of cam surfaces or projections on its periphery. The presser foot has an up-and-down and a to-and-fro movement. The needle slide receives its up-and-down

motion from a slide and roller. An instrument for taking up the slack is fitted to the lower end of a vertical rod working in the head of the bracket "and made in two separate parts held together by a helical spring." Under the bed plate is a vertical spindle, to each end of which is fitted a pinion; the upper one imparts motion "to a double rack which actuates the thread distributor under the needle" by any "convenient contrivance." A horizontal table or platform may be screwed or otherwise affixed to the horn if required.

"The stitch produced is the single thread chain or tambour stitch, and a hooked needle is employed into which the thread is placed, after it has penetrated the material, by the thread distributor."

[Printed, 4*l*. No Drawings.]

A.D. 1864, January 8.—No. 51.

PIDDING, WILLIAM.—(*Provisional protection only*).—"Improvements in the manufacture of soles and heels for boots and shoes, and also in the manufacture of horse shoes." The soles and heels of boots and shoes are made of india-rubber or other elastic material "with cells or cavities on one surface and projections of less superficial area on the opposite surface." The cavities are filled with studs or plates of metal or composition of a less yielding character than the elastic material. The studs are to be inserted "on that surface of the sole or heel which will be the outer surface when applied to the boot or shoe." Holes are formed in the projections for the insertion of screws or rivets for the purpose of fixing the soles or heels to the boots or shoes. This arrangement affords "an elasticity of tread not secured by the comparatively rigid soles and heels in ordinary use." The inventor puts "a border of the elastic material round the outer surface of the sole or heel" (which he prefers to be "of greater width than that of the partitions between the cells") and "a border connecting the projections on the inner surface."

[Printed, 4*l*. No Drawings.]

A.D. 1864, January 14.—No. 102.

WADSWORTH, JOSEPH.—"Improvements in the construction and manufacture of moveable or adjustable heels for

"boots and shoes." This invention is claimed by the patentee as an improvement on the one for which James Wadsworth obtained Letters Patent dated March 13th, 1862, No. 687.

Two arrangements are described. In the first, the disc which is permanently attached to the heel has a central recess and four slots in the prominent part surrounding the recess; "at the inside there is a spring, the front part of which is bent downwards so that it can pass through a narrow slot in the aforesaid prominent part." The disc to which the wearing part of the heel is attached has a projecting central bearing and four projections, "each having a groove at one edge;" in the disc are four narrow slots "for the front part of the spring to pass through." The bearing fits the recess; the projections pass through the slots and are "slightly turned so that the grooves pass on to the edges of the slots" and hold the discs close together; the front end of the spring passes through one of the narrow slots and prevents the heel from turning. When the heel requires turning, a wire "is passed through a hole in the outer rim" of the first-mentioned disc in order to raise the spring.

In the second, the fixed disc has a central recess, outside of which are four grooved projections at the inner edge of the prominent part, and "in the interior of the said prominent part there is a spring, the fore end of which is bent so as to pass through a slot in the said prominent part." The moveable disc has a projecting central bearing, four grooved projections outside the bearing, and four slots in the outer rim. When the discs are put together, the projections "interlock in each other," and the fore end of the spring entering one of the slots prevents the projections from being loosened from each other. The spring is lifted as in the first arrangement.

The number of projections and slots in each arrangement may be varied.

[Printed, *Ed.* Drawing.]

A.D. 1864, January 18.—No. 135.

MAINSTONE, EDWARD.—(*Provisional protection only.*)—"Improved arrangements for securing trowser straps to boots, overboots, shoes, or such like coverings for the feet, particularly adapted to be used for riding purposes." In or near the waist of the boot or shoe an opening is made from one side

to the other; the opening is protected by a metal plate secured to the leather; and the strap is passed through the opening.

[Printed, 4d. No Drawings.]

A.D. 1864, February 11.—No. 362.

KEATS, JOHN and CLARK, WILLIAM STEPHENS.—(*Provisional protection only.*)—"Improvements in the manufacture of boots "and shoes and in apparatus to be employed in such manufacture." The soles are made by pressing leather into moulds whose sides are "inclined in the manner required "for giving the requisite bevel to the edges of the leather." The sides are made "by forming a slot or hole of the requisite "form for a sole through a plate of metal." The bottom of this plate "enters into and fits a recess in the lower die." The sides of the plunger "pass down freely through the hole "or slot in the plate." Sometimes the upper surface of the lower die and the under surface of the plunger are shaped "for moulding a sole together with the usual shank and "bottom filling pieces." The sides of the slot are bevelled outwards also, "in order that the plate may be reversed" for the moulding at one time of a right hand and at another time of a left hand sole. The bottom of the mould is perforated for the passage upward of a rod, on whose top is a plate lying in a recess in the bottom of the mould; by this arrangement the sole is lifted out of the mould.

If the sole is to be sewn to the upper, a knife (in some cases) projects up all round the edge of the bottom of the mould; it forms a recess in the bottom of the sole for the stitches to lie in.

If the sole is to be sewn to a welt, sometimes a projection is made round the edge of the bottom of the plunger; this forms a recess round the edge of the sole, "in which the "welt can lie after the boot has been sewn."

If the sole is to be riveted on, punches are arranged round the edge of the bottom of the mould, and a perforated plate is placed over the bottom of the mould, "so that these punches "may pass up through the holes."

Heels are moulded in a similar manner, and sometimes the mould is shaped for forming a heel and a sole at the same time.

The side edges of soles and heels are polished by means of circular revolving burnishers heated by gas jets. The jets are below the burnishers; a guard is placed over the jets, and the lower parts of the burnishers "pass down through slots in this guard."

On the end of the burnishers' axle is a crank, "from which a to-and-fro motion is imparted to a flat rasp or serrated surface that is used for finishing the bottom surfaces of the soles."

[Printed, 4d. No Drawings.]

A.D. 1864, February 12.—No. 368.

WHITE, THOMAS. — "Improved machinery for uniting the soles and uppers of boots, shoes, and similar coverings for the feet, applicable also for uniting hose, pipes, harness, mill-straps, and other like purposes." The "principal features" of this invention are (1) the use of a continuous length of wire; (2) the use of two "silent feed" motions (Howe's patent), one for propelling the wire, the other for turning round the boot or shoe; (3) a combined guiding and cutting apparatus; (4) an "adjustable nicker for forming a groove or race on the sole in the line where the rivets are required."

A frame or standard carries on the top a reel filled with the wire. It carries also (1) a weighted lever when the machine is worked by hand; (2) an inner slide ending in a **V** and actuated by the lever; (3) an outer slide held in position by lips; (4) cranked levers affixed by their fulcra to the outer slide and furnished with friction rollers on their upper ends and with jaws or cutters on their lower ends; (5) the upper silent feed motion; (6) a nicker or bar sliding in a recess in the frame, "projected to the table of the machine" and having its projecting end turned down to cut grooves in the sole.

Beneath is "a planed traversing table," actuated by a screw which works in a female screw in the frame. On the table is "an interchangeable cam" supporting a rack and a last. The rack is moved by wheel gear, and the lowest wheel is carried by a shaft furnished with the lower silent feed motion, which is set in motion by a lever connected to the main lever. The lip of the cam is "removeable being affixed by screws and having its inner and outer edges shaped according to

"the curve of the line of rivets required." The last and last frame are caused to revolve by means of a horizontal shaft (under the table) having a bevelled wheel on its extremity which gears with the lowest wheel before-mentioned.

The patentee prefers in some cases "to use a simplified arrangement which presents modification of details, the principle being unaltered;" he describes the modifications and also the action of both machines.

[Printed, 1s. 6d. Drawings.]

A.D. 1864, March 11.—No. 619.

JONES, WALTER THOMAS WHITMORE.—"Improvements in the construction or arrangement of laced boots." The lace after passing through the eyelet holes is tightened by winding it on a reel or winder; it is so long "that it can without unthreading it from any of the eyes in the boot be sufficiently loosened to allow of the boot being taken off readily."

The winder consists of a bobbin mounted in a frame on which it can be readily turned, and a catch or stop "which at its point enters between the teeth on one end of the reel or winder," so as to keep it from turning. The frame is fixed by sewing or otherwise to the upper part of the boot, and "at the other side of the frame" there is a short strap sewn to it; the strap (when the boot is on the foot) is held by a buckle "on the other side of the boot to that where the winder is fixed."

One end of the lace is passed through a hole in the barrel of the winder, so that when the winder is turned it will wind up the lace, "and the lace will be retained by the catch."

"The reel of the winder may be closed in at the edges." The several parts and their arrangement admit of variation.

[Printed, 6d. Drawing.]

A.D. 1864, March 19.—No. 704.

SEARLE, THOMAS JOHN.—(*Provisional protection only.*)—"Improvements in apparatus for cleaning and polishing boots and shoes." Three "circular surface brushes," having the bristles set on the face "as near as may be at right angles thereto," are mounted on spindles; each spindle carries a pulley connected to a treadle. The first brush is made with

strong bristles for brushing off the dirt; the second with soft bristles for applying the blacking (this brush is "arranged " to be driven at a comparatively slow speed); the third with bristles suitable for polishing; it is to be driven "at a comparatively high surface speed."

The apparatus may be made with one spindle, the brushes being arranged "to be readily changed, and the speed of " rotation varied." Or the apparatus may be made with two spindles.

[Printed, 4d. No Drawings.]

A.D. 1864, March 21.—No. 714.

HILL, CALEB.—"An improvement in the manufacture of " boots and shoes." This invention (which applies chiefly to club sole boots and shoes) permits of "the easy renewal by " the wearer of the sole when worn."

A metal frame is divided into two parts at about the middle of its length, and the parts are connected by a hinge joint. The front part is pinned or screwed to the inner sole, and the hinder part is secured to the waist by a bolt. The sole piece " is slidden into the frame while the moveable portion is raised, and when pressed home, this portion is brought down and fixed by the bolt. The inner edges of the frame incline inwards so as to overlap the edges of the sole piece, and the edges of the sole piece are bevelled to fit the frame.

"By making the side seams in the upper leather correspond " in position with the joint in the metal frame, the tendency " of the uppers to crack will be materially diminished."

"For lighter boots" the frame is smaller and not jointed; it is screwed to the sole and is surrounded by a filling piece which lies flush with the face of the frame. The hinder end of the frame is a detachable cross bar, which is screwed down when the sole is slidden in to the frame.

The heel is made with "a circular tip which admits of being " shifted when worn on one side."

[Printed, 8d. Drawing.]

A.D. 1864, March 23.—No. 735.

FORGIE, WILLIAM.—(*Provisional protection only.*)—"Im-
" provements in treating or preparing gutta percha, leather,

“ or other materials for the manufacture of boots and shoes, “ and for coverings for floors, and other like purposes.” The inventor uses for outer soles a combination of strips of cork with gutta percha or other material. These soles “ although “ preventing the admission of moisture will possess ventilating “ properties ” and prevent slipping.

The combination may be made (1) by softening the gutta percha and inserting the strips therein by means of pressure in moulds; (2) by making holes or recesses in the gutta percha and securing the strips in the holes by means of pegs or cement; (3) “ in any other convenient manner.”

[Printed, 4d. No Drawings.]

A.D. 1864, April 12.—No. 918.

FRASER, ALEXANDER JOHN, and SQUIRE, FREDERICK.—
“ Improvements in stamping, marking, and punching vamps; “ toe caps, and other parts of boots and shoes, and in the “ construction of apparatus for the same.” These three operations (as well as the cutting out of toe caps, &c., if required) are effected at one time by means of an apparatus of the following construction:—

A thin sheet of metal (by preference of brass) is cut to the required form; the design is traced upon it or transferred to it; minute holes are bored through it “ at distances according “ to the size of the stitches to be afterwards produced on the “ material to be operated on;” and sharp-pointed steel pins are fitted into the holes, their pointed ends projecting about “ one-sixteenth of an inch.” The back of the plate and the pins are made flush and tinned, so that they can be soldered to a “ strong backing plate.” Hollow punches also are screwed into the plate, if “ holes constitute part of the design;” they are made “ somewhat longer than the pins to allow for wear.” The backing plate is provided either with a handle for effecting pressure by hand, or with a suitable stem for fixing into a press; or it may be left plain, and pressure may be applied by other means.

A cutting edge may be fixed round the edge of the apparatus.

[Printed, 6d. Drawing.]

A.D. 1864, April 16.—No. 968.

SMITH, ARTHUR WILLIAM.—“ Improved machinery for “ making pegs and rivets, and rivetting and pegging boots,

" shoes, and similar coverings for the feet." The machine is usually worked by a treadle, and the whole of its operations are performed "with one revolution of the main shaft." This shaft carries at one end a pulley connected to the treadle and at the other "the working head" which is supported by a "rocking shaft." On the main shaft are circular cutters for cutting pieces of wood into strips for pegs. The strips are placed in the grippers of a carrier and conveyed to a tubular guide "which rests upon the boot, shoe, or material to be worked," and "when the end of the strip of wood or wire is at this point," it is cut off by "dividing and pointing knives" connected to the end of the main shaft; a gauge regulates the length to be cut off. An awl put into action pierces a hole in the material, and a hammer or punch forces in the peg or rivet. By means of "a tongue piece" secured in the working head "an alternating action of both the hammer and awl is maintained together with compactness of arrangement of mechanism."

"At the rear end of the main shaft is keyed a cam which acts upon a lever centred to the main frame." To the lower end of this lever is attached a pawl which works in the teeth of a wheel keyed on a shaft beneath the bed plate of the machine. On the other end of this shaft is a toothed wheel "which works into teeth beneath a slide stand for boot or shoe holders; the holders can be regulated in position by set screws."

The Specification contains a detailed description of the machine and its action, and a modification of the boot or shoe holder.

[Printed, 10d. Drawing.]

A.D. 1864, April 22.—No. 1011.

PEPPER, TOBIAH.—"An improved boot and knife cleaning machine." The "leading principle" of this invention is that the articles to be cleaned are held firmly by "spring holders radiating from a common axis by means of radial bosses," and that these holders in their revolutions press the articles through sets of cleaning apparatus.

A fixed circular case or drum mounted on a stand has a rotating axle passed through it. On the axle are radial bosses mortised for the reception of the heads of the spring holders. Each holder "terminates in 4 spring legs" for the purpose of

holding "4 boots or shoes abreast." A "tapering tongue" runs about "half way down the leg," and at the bottom of the tongue there is a socket into which a foot piece fixes. The lower part of the leg is shaped "to suit the heel of the boot," and a heel piece may be attached thereto. The sides of the foot piece and the heel piece are sufficiently elastic to adapt themselves to the boot or shoe. The tongue "acting as a spring allows the foot piece to contract into a shorter space" "by yielding to the required pressure" and thereby suit various sized boots and shoes. "A waterproof stocking" can be drawn over such parts of boots as do not require to be blackened.

The brushes "are principally attached to the inner side of the periphery of the drum;" their bases "form moveable parts or arcs, which can be readily fixed for use, removed, adjusted, and replaced;" they are arranged in pairs, "nearly semicircular in form, of sufficient size to span a boot, and of any convenient length;" they are "open at the top of the arc but meet or overlap in the centre thereof so as to permit the boot to pass freely through the segmental chamber."

The blacking is supplied to the proper brushes "from a reservoir connected therewith and conveyed through suitable channels to all parts of the brushes."

The method of making the dirt and polishing brushes "so as to allow them a little play, the structure and arrangement of the blacking brushes, the construction and position of the blacking reservoir, and the mode of using the machine are explained in the Specification.

[Printed, 1s. 6d. Drawings.]

A.D. 1864, April 22.—No. 1020.

FELDMAN, SIMON FERDINAND.—(*Provisional protection only.*)—"An improvement in boots," the object being "to secure a good and easy fit across the foot."

A piece of elastic web is introduced into the fore part of the boot "from the toe piece to above the instep." Buttons or other ornaments may be placed on each side of the web, and elastic laces may be carried across from button to button.

[Printed, 4d. No Drawings.]

A.D. 1864, April 28.—No. 1072.

GHISLIN, THOMAS GOULSTON.—“Improvements in the treatment and application of seaweed.” The patentee proposes to call the article produced by his treatment of seaweed “algaeite.” He applies his algaeite to the manufacture of a variety of articles, among which are mentioned hats and caps; he also moulds it into soles for boots and shoes.

He first treats “any of the common kinds of seaweed” in the manner described in the Specification of Letters Patent obtained by him on July 15th, 1862, No. 2035, and reduces them to either a powder or a paste. He incorporates the powder or paste with the following ingredients or some of them in proportions suited to the article to be made:—Gums, gum resins, resins natural or artificial, bituminous substances, paraffine, oily or fatty substances, fibrous materials, silicates of potash and soda, pulverized chalk, talc, earthy matters, metallic oxides, gelatine, farina, alum, tungstic acid, powdered charcoal, and other analogous substances. He states the particular ingredients and proportions which he prefers, according as he requires tenacity, elasticity, solidity, or durability. For the purpose of incorporating the mass he uses a masticator provided with mixing rollers or other mechanism, and he afterwards passes the mass between cylinders.

The algaeite may be hardened and rendered waterproof by steeping it in boiled oil or in any drying oil, or in a solution of gum or resin, or in any kind of varnish.

[Printed, 4d. No Drawings.]

A.D. 1864, May 7.—No. 1155.

JOHNSON, JOHN HENRY.—(*A communication from Horace Miltimore Bearce.*)—“Improvements in protecting parts of “boots and shoes.” The parts to be protected by this invention are the toes and the portion of the upper near the toes; and the protection is obtained by either of the following methods:—

1. Ornamental or other nails are driven into the outer sole immediately in front of the upper, so that their heads “may cover or partly cover the toe part of the upper.”

2. A metallic cord or beading is introduced into the crevice between the outer sole and the upper. The cord may be cut

out of a sheet of metal, and a bead is turned up on its outer edge. The flange portion is put in between the sole and the upper when making the boot or shoe, holes being made through it for the reception of the fastenings.

[Printed, 6*d*. Drawing.]

A.D. 1864, June 8.—No. 1427.

CRICK, JOHN THORNE.—“Improvements in the manufacture “ of boots, shoes, and slippers.” The upper and the insole are put on to a last (either of metal or covered with metal); the edges of the upper are turned over those of the insole and fastened thereto by small nails or tacks which are clinched on the last. The outer sole is then cemented to the insole (or to the edges and bottom filling of the insole if bottom filling is used) and the edges of the upper; pressure is applied to the outer sole “in order to consolidate it,” and the bottom is finished “by being buffed or polished in the ordinary manner.” The patentee claims for his method of manufacture retention of shape, lightness, and durability.

[Printed, 4*d*. No Drawings.]

A.D. 1864, June 30.—No. 1634.

BROOKES, WILLIAM. — (*A communication from Albert Francis Johnson.*) — “Improvements in sewing machines.” The improvements relate particularly to means for “facilitating the employment of waxed threads for uniting leather or “ other heavy fabrics, such as boots, shoes, harness,” &c. A “puncturing awl” and an “open-eyed hooked needle” are used, and with them “a shuttle for causing the formation of “ a lock stitch.” In order that the needle may not remain in the material while the stitch is being tightened, “which is “ fatal to practical sewing with a waxed thread,” a take-up operates independently of the movement of the needle and in such a manner that while the thread is being conveyed through the material, “it shall be slack and subject to no tension.”

The material being placed in position on the platform, and the two threads being arranged in the required manner, the awl descends, puncturing the material and feeding it along until the hole is in the proper position for the needle to pass through in its upward movement. “While the awl is thus “ descending, the needle also descends and passes down

" through the aperture made in the fabric by the previous descent of the awl, carrying with it the thread which had been first placed around and within its hook by means of the thread carrier." The needle continues to descend until it has passed through the material, when it "is made to revolve, making about one-third of a revolution" for the purpose of bringing the loop formed by its hook and carried through the fabric into the path of the shuttle. During the downward movement of both the awl and the needle, the shuttle travels in its guiding way, and when the awl and needle "commence to ascend" it "moves forward passing through the loop of the thread left in its path by the hooked needle."

In order to tighten the loop and interlock with it the shuttle thread, the inventor provides an arrangement consisting of a vibrating arm, swivel box, and pulley, the operation whereof in connection with the movements of the awl and needle he explains at length. The vibrating arm draws the thread from the spool and feeds it along "in a slack condition" to the needle, but "as they ascend the arm travels back to its original position." By this forward and backward movement of the arm, "during the whole time occupied by the needle in its descent, the arm is drawing the thread from the spool and feeding it to the needle, thereby keeping the thread slack while being pulled through the fabric;" but as the needle ascends the arm travels back to its starting point, drawing up and tightening the loop.

[Printed, 3s. Drawings.]

A.D. 1864, July 6.—No. 1680.

BUGG, FREDERICK JOHN.—"Improvements in the manufacture of pressed leather," a material employed "in the interior of the soles of boots and shoes and for other uses." Instead of making his pressed leather from "curriers' shavings which are saturated with flour paste," the patentee makes it from "tanned flushing pieces" in combination with "gelatine or animal glue."

The pieces are damped with water or a weak solution of gelatine or glue and "are left for from 12 to 18 hours until they get into a soft mellow state." Each piece is then passed through a strong solution of gelatine or glue and

spread upon a sheet of zinc which is slightly oiled to prevent the leather from adhering to it. Layers are placed one above the other on the sheet, "until the requisite and a uniform substance is obtained." A sheet of galvanized iron (slightly oiled) is put on the top of the layers, and the whole is pressed for about 12 hours in a hydraulic press with a pressure of about 150 tons. The consolidated sheet is then separated from the sheets of iron and zinc, put into a rack and exposed to the air, or put into a drying shed; when dry it is fit for use.

[Printed, 4d. No Drawings.]

A.D. 1864, July 6.—No. 1681.

STURTEVANT, BENJAMIN FRANKLIN.—"Improvements in the mode of uniting pieces of leather and in the manufacture of shoes and boots." The outer sole, upper leather, and inner sole are united by means of thread and pegs, both "inserted within a series of awl holes."

The holes being made, the thread is either sewn through them or looped within them. A peg is then driven into each hole, "so as to either compress or expand the thread within the hole and against its side or sides in manner to not only firmly fix or aid in fixing the thread in the hole, but at the same time to firmly fasten the peg therein."

The piercing of the holes and the insertion of the thread and pegs may be effected by hand or mechanism. "There are various other ways in which the thread may be introduced into or sewed relatively to the awl holes."

[Printed, 6d. Drawing.]

A.D. 1864, August 11.—No. 2002.

LANG, PETER.—(*Provisional protection only.*)—"An improved knife for cutting the clamps of boots and shoes." This knife is so shaped "as to cut from the centre or body of the clamp a piece of leather of such form as to be adapted to the formation of one side of another clamp," thereby economizing time and material.

One figure in the sheet of drawings shows a knife "for cutting a clamp and a half" at one operation; another for cutting "two clamps" at the same time.

"At each operation the knife is reversed," whereby the piece cut from the body "is brought into position with the knife for forming the side of another clamp."

There are spaces or depressions in the face of the knife "for the purpose of leaving small portions of the material forming the clamp, in order to hold the clamps together until it is desired to separate them."

[Printed, *ed.* Drawing.]

A.D. 1864, August 27.—No. 2113.

HASELTINE, GEORGE.—(*A communication from Gordon McKay.*)—"Improvements in mechanism employed in the manufacture of boots and shoes." The first part of the improvements relates to "modifications in the details of the sewing machine shown and described in the British Patent, No. 1113, dated April 16th, A.D. 1862." These will be found in the series entitled Sewing and Embroidering.

The second part relates to mechanism "for cutting channels and grooves from and in the surface of soles":—A plough or tubular knife is combined with a straight knife; the former cuts out a channel for containing the stitches; the latter cuts out the opening leading from the surface to the channel in such manner as to form a flap; each "extends from a separate stock or plate," so that they can be adjusted with respect to each other, and sometimes both knives are made "in one piece." A bed piece carries (1) a shaft "to which a feed wheel is applied," (2) a head piece to which the knives are fixed, and (3) "an edge roll for guiding the edge of the sole to keep the channel equidistant from said edge." The head piece carries also a roll, "which holds the sole down upon the teeth of the feed wheel." The head piece is arranged as a lever; it is hung at its rear end upon the bed piece, and near its front end a rod hangs down, allowing it to be worked by the foot of the workman; it is hung upon a pin in "an elongated bearing slot, so that it can be moved forward or backward on the pin. Other parts of the mechanism are (1) a guide roll, (2) a gauge foot, (3) a spring for lifting or partially lifting the sole from the teeth of the feed wheel "when turning the short curves of the sole," (4) a stop plate "preventing its further rise." The arrangement of the several parts and the action of the machine are detailed in the Specification.

The third and last part describes "a device for stripping " from thread the superfluous wax with which it is covered " after immersion therein when in a warm and fluid or semi- " fluid state." This stripper is composed of a receptacle for wax, a water bath, "a lamp protector and supporting case," and a bent lever pivoted to the frame. The frame and the end of the lever "where they come together" are "fitted to a close " joint," in which holes are drilled, "one half of each hole " being in each part." A spring keeps the lever in place " against the tendency to cause it to move by the ordinary " friction of the waxed thread as it passes from the heated " wax through one of the stripping holes," but it lets the lever move outward whenever a knot or enlargement in the thread presents itself.

[Printed, 2s. 4d. Drawings.]

A.D. 1864, August 31.—No. 2137.

STENHOUSE, JOHN.—"Improvements in rendering certain " substances less pervious to air and liquids, and also less " liable to decay." Among the materials and articles to which this invention relates are mentioned "leather in the sheet" and "all articles manufactured from leather, such as boots, " shoes, harness, &c."

The composition used consists of paraffine, or mixtures of paraffine with beeswax or any of the vegetable waxes, or mixtures of paraffine with stearine, stearic acid, tallow, or any other of the solid fatty principles, and from 5 to 30 per cent. of linseed oil or other drying oil, with or without solutions of caoutchouc or gutta percha in a drying oil. The ingredients are melted together, and the mixture is usually moulded into blocks. If however large quantities of oil are used, the mixture has a pasty consistence, and it is more conveniently applied in a melted state or in solution.

Leather is impregnated with the mixture either by rubbing in on one or both sides, the leather being warmed sufficiently to melt the mixture easily, or by melting the mixture and brushing it over the leather, or by immersing it into a bath of the mixture heated to not more than 145° Fahr. Light coal tar, naphtha, petroleum oil, or bisulphide of carbon, may be added to the mixture. In the treatment of thin leather it is found advisable to increased the proportion of drying oil, " in some instances to even as much as 80 per cent."

[Printed, 4d. No Drawings.]

A.D. 1864, September 10.—No. 2209.

FONTAINEMOREAU, PETER ARMAND le Comte de.—(*A communication from Jovite Chuvin and Eugene Chuvin.*)—(*Provisional protection only.*)—"Improvements in machinery "for the manufacture of boots and shoes." A standard has a piece cut out of the middle of its upper part, "so as to form "two upright blocks at the sides." One block is higher than the other, and "its edge is cut on the bevel and slightly concave," so as to fit it for receiving the front part of a last. The other block is square on the top and serves to receive the heel part of the last. The surfaces of both blocks are covered with leather padding to preserve the leather of the boot or shoe from injury. In the standard and between the blocks is a cylindrical hole, in the upper part of which an iron bearer is fixed by a set screw. To the bearer is jointed an arm carrying "a smaller arm also jointed, so that they may be moved in "almost any direction" between the blocks. In the top of the smaller arm is a socket in which the end of a pin fits. Round the lower part of the pin is a groove for the reception of the end of a set screw, "so that the pin can turn freely in "the socket, but the set screw serves to keep it from moving "vertically." On the top of the pin is a washer whereon the last is screwed. By the foregoing arrangement "the last can "be easily brought into any position that may be required on "the said blocks." A cross piece reaching from block to block gives an additional support to the last. The standard "terminates in a cylindrical bearer, whereon is fixed a washer carrying a screw and thumb nut, so that the apparatus may be secured in any convenient position to the side of a table, bench, or bracket.

[Printed, 4d. No Drawings.]

A.D. 1864, September 15.—No. 2246.

HASELTINE, GEORGE.—(*A communication from Joseph Blanchard Crosby.*)—"Improvements in the manufacture of "boots and shoes." The vamps and soles are united by means of sewing machines, for which Letters Patent were obtained in the years 1859 (No. 1111), 1860 (No. 2208), 1861 (No. 483), and 1862 (No. 1113).

One part of the invention relates to "a turned boot or "shoe," in which the stitches uniting the vamp and sole pass

through the upper and through "a lip or flap which is cut into and is temporarily raised above the surface of the sole." Two lasts are used; one upon which the sole is temporarily secured; it is narrower and shorter all around than the other, "so that the edge of the sole can be turned from the face of the sole of the last down upon and around the sides, toe, and heel," and the flap be "about at right angles with the surface of the sole." The stitches pass through the upturned flap and the vamp close to the face of the sole." The flap and vamp are afterwards "pressed down on the surface of the sole, and trimmed as closely thereto as the seam will permit." The last is then taken out, the boot or shoe is turned, the larger last is put in, and the boot or shoe is "finished as is usual."

Another part relates to a turned boot or shoe in which the vamp and sole are united "by chain stitches;" these pass from the inside to the outside, so that the chain of the stitches appears in the finished article on the inner surface of the vamp, whilst the plain part "comes aloft, i.e. on the surface of the sole or in a channel cut from the wearing surface." A pattern is temporarily secured to that face of the sole which comes outside in the finished article, and "a cylindrical or conical gauge" is placed "on the surface of the tip of the horn of the machine."

Another part consists in the employment of "a novel stitch" made by chain stitch sewing mechanism "with such appliances as will prevent each loop as formed from being drawn through and locked with the last formed loop, and will also prevent the withdrawal of the formed loops out of the stock." The parts united are held together "by a series of thread staples;" the bars come upon the inner surface of the article, "while the staple points come on the outer surface of the sole, where they rivet or head up in practical wearing use."

Another part relates to boots and shoes made without being turned inside out:—The vamp and outer sole are united by chain stitches, the chain coming on the outside surface of the sole or in a channel therein. If an inner sole is used, it is not sewn in with the vamp and outer sole, but is attached only "by the few lasting tacks which confine the vamp to the inner piece."

[Printed, 10d. Drawing.]

A.D. 1864, September 17.—No. 2287.

NAPIER, JAMES MURDOCH.—(*Provisional protection only.*)—“Improvements in apparatus for cleansing the lower parts “ of boots and shoes.” A grating “suitable to be walked on” is provided in the place where it is desired that the cleansing should take place. Between the bars of the grating there is applied a brush or other cleansing surface “made of vulcanized “ india-rubber or other material which is caused to move by “ any suitable power.” The bristles or other projecting parts of the cleanser project somewhat above the bars, and thus “ the lower parts of the boots and shoes of persons standing “ or walking on the grating will be cleansed.” In some cases a receptacle is added for receiving the dust and dirt from the brushes or cleansers.

[Printed, 4d. No Drawings.]

A.D. 1864, September 28.—No. 2378.

DAVIES, GEORGE.—(*A communication from Henry Louis Charlemagne Lhuillier.*)—“The employment and application “ of thin strips or sheets of wood for various new and useful “ purposes.” The applications mentioned are many; those which relate to this division of the series are

(1.) Strips (one or more) are cemented, sewn, or otherwise introduced between the leather soles “ to resist damp and also “ to obtain with economy the thickness desired.”

(2.) Loose soles are made of strips or sheets of wood as a substitute for cork soles.

[Printed, 4d. No Drawings.]

A.D. 1864, September 30.—No. 2408.

KEER, HENRY JOSEPH.—(*Provisional protection only.*)—“Improvements in ladies’ boots,” affording increased protection to the leg and imparting ornament to the boot.

The upper edge of the back and front parts “is extended “ upwards above the side springs or other fastening.” These parts are formed with wing pieces so as to embrace the leg on each side; they are fastened by loop and button or otherwise and serve as a leglet.

These extended parts and wing pieces may be varied; they may be cut from the same leather as the back and front parts,

or separately therefrom and sewn on; or they may be of a different material.

[Printed, 4d. No Drawings.]

A.D. 1864, October 7.—No. 2477.

KEMP, HENRY, and KEMP, FRANCIS JOHN.—“Improvements in the preparation and hardening of leather for boot and shoe soles, straps, and bands, and other purposes.” The leather is hardened and rendered waterproof in the following manner:—A solution is made by mixing pyroligneous tar (1 gallon) with about 1 quart of methylated spirit (of about 60° above proof) or pure spirits of wine, wherein shellac (from 2 to 8 ounces) has been dissolved. Or an aqueous solution of shell-lac may be used “by mixing it with common borax or the biborate of soda and boiling water.”

The patentees do not confine themselves “to any particular mode or process for injecting the leather;” they describe 5 plans, in each of which the leather is put into a close vessel and covered with the solution (sometimes adding thereto dissolved india-rubber); the air is exhausted, and the solution is allowed to impregnate the leather.

The leather is afterwards subjected to pressure to expel the superfluous solution, and is then set aside to dry; when dry it is to be either rubbed with a solution of from 3 to 4 ounces of india-rubber in 1 gallon of naphtha or other solvent, or put into a close vessel and impregnated with the latter solution in the before described manner.

The process will be facilitated by heating the solutions to from 80 to 90° Fahr.

Skins may be treated whole or in pieces of any size, but it is preferred to cut out or stamp boot or shoe soles to the required size before preparing them.

“As a medium for firm adhesion of the prepared leather” the patentees use “asphaltum or mineral tar with shell-lac dissolved in methylated spirit in combination with caoutchouc dissolved in naphtha” and heated to from 70° to 80°.

[Printed, 4d. No Drawings.]

A.D. 1864, October 15.—No. 2546.

DAVIES, GEORGE. — (*A communication from William Adamson.*)—(*Provisional protection not allowed.*)—“An

" improved mode of economizing the manufacture of useful articles of leather." The inventor asserts that the ordinary mode of cutting sole and heel pieces and other useful articles from tanned leather involves the sacrifice in waste of one-fifth of the entire area, and consequently of the weight of the strip. To avoid this loss and render the remnants of marketable value, he cuts the required articles from the raw hide, tans them, and leaves the remnants of the hide "to be converted into glue, gelatine, or into size for paper makers."

[Printed, 4d. No Drawings.]

A.D. 1864, October 17.—No. 2563.

BROWNHILL, JOHN. — (*Provisional protection only.*)—

" Improvements in the manufacture of feet casts and lasts for boot and shoe making." A piece of wood is shaped "nearly like the sole of a clog" and is provided with a spring at the heel, "which can be elevated or depressed according as a high or low heel is required." A rim of leather, tin, or lead, is put round the sole, and the hollow space is filled with clay or other plastic material. The foot is pressed on to the clay, and a thin strip of lead or tin, bespread with clay or other plastic material, is bent closely round the heel so as to take an impression thereof. The top part of the foot from the toes to the ankle joint is taken with modelling plaster, but to prevent the plaster from spreading when poured on the foot, a piece of thin lead (about an inch and a half wide) is bent round the forepart of the foot at the distance of about an inch, "so as to rest firmly on the clay sole." Modelling plaster is poured into the cast thus obtained, and from the model a strong plaster cast is made in any suitable number of pieces. This cast is put into a press, and all the interstices are filled up with softened gutta percha, or "gutta percha mixed with wood, sawdust, cork, or sal-ammoniac." To allow for the prolongation of the foot in walking, gutta percha is added to the toes, and to facilitate the getting out of the last when the boot or shoe is made, there is "cut in it a block," which if required may be divided into pieces.

[Printed, 4d. No Drawings.]

A.D. 1864, October 25.—No. 2637.

CRAVEN, HENRY EDWARD, and CARRACK, THOMAS.—"Improvements in machinery or apparatus for cutting out and

"pricking the soles and heels of boots and shoes, applicable also to other purposes." Standards are braced together by a table. A shaft, under the table and actuated by pulleys through intermediate wheels, carries cams which impart a reciprocating motion to slides working up and down in V grooves. The slides are connected by a crosshead, to which are secured frames carrying wood blocks and guides. The blocks are bound with an iron hoop and are adjustable in position by set screws "in the V races of the frames." The guides provided with set screws prevent the leather "from being thrust too far either laterally or longitudinally." On the table are adjustable frames carrying clips which "support the knives," and "may be adjusted by set screws according to the size of sole or heel required." Two spring clips are employed "to stiffen the knives." The prickers consist of a framework of pricks or needles fastened to the blocks and piercing the leather in their descent.

The leather is placed over the knives; the crosshead descends; the pressure of the blocks cut the soles or heel required, which drop through the knives and apertures in the knife-frames and table into a receptacle.

[Printed, &c. Drawing.]

A.D. 1864, October 28.—No. 2667.

JACKSON, WILLIAM.—"Improved arrangement of the parts in sewing machines for using shoemakers' wax thread for sewing on the soles of boots and shoes." The patentee states that in his arrangement he succeeds in dispensing with "a great deal of complication of cams, secondary parts, and apparatus, and in particular with reciprocating motion in the under side and thread-carrying apparatus, obtaining constant motion in place thereof."

He claims, first and specially, the working the thread carrier "with a constant revolving motion in one direction." This rotatory thread carrier, situate at the upper end of a horn, is "a hollow cylinder, the hollow centre of which allows the descent and passage of the needle hook through it"; it has also "a second and smaller transverse hole or passage beside the central aperture for the purpose of carrying the thread which is put through it and thereby guided so as to be seized by the hook in order to form the loop to be drawn

"through so as to form the stitch." The motion is obtained by means of a rod in gear at its upper end with the cylinder and connected at its lower end with a shaft, which revolves constantly in one direction by being in gear with the lower end of a vertical shaft whose upper end is in gear with the main shaft.

The presser foot bar and the needle bar are connected with a disc attached to the main shaft, and "the general combination, also the arrangement, construction, and mode of operating the several working parts," are claimed and described in the Specification.

[Printed, 1s. 2d. Drawings.]

A.D. 1864, November 4.—No. 2736.

FRASER, ALEXANDER JOHN.—(*Provisional protection only.*)

—"Improvements in apparatus for stamping or marking vamps, toe-caps, and other parts of boots and shoes, which apparatus is also applicable to stamping or marking other articles of leather." The improvements relate to the method of "producing the prick points" of the tool. For this purpose a piece of metal is prepared "in form according to the form of design described on the face" thereof. The points are raised in manner "similar to cutting the teeth of a rasp" and following in outline the design to be stabbed or marked. Punches are added to the apparatus if holes are to form part of the design.

Or the points may be produced in a thin piece of metal by "driving them up from the back by means of a small and sharp centre punch." The piece is then to be soldered to a backing of thicker metal, introducing punches if desired.

Or "a sharp-pointed triangular punch" may be employed; this being driven through the thin metal from the back, "cuts two sides of the triangle, leaving the other intact and causing the piece partially severed to stand up on the face of the plate."

This apparatus may be used for stamping or marking anklets, armlets, gloves, and other articles of leather required to be marked in outline for the sewing to be performed thereon.

[Printed, 4d. No Drawings.]

A.D. 1864, November 8.—No. 2774.

OKEY, JAMES.—(*Provisional protection only*).—"Improve-
ments in boots and shoes." The object of this invention is
to prevent the elastic gussets let into the sides "from wearing
away so rapidly as is now the case."

The gussets are covered with an overlapping piece of leather
or other material, which is kept in its place by two or more
elastic straps attached to it and passing round either the back
or front "between pieces of leather or other material placed
inside the boot or shoe." These straps "divide the strain
and therefore preserve the gusset longer than heretofore,"
while the leather prevents "undue friction."

[Printed, 4d. No Drawings.]

A.D. 1864, November 26.—No. 2957.

HEINZMANN, MARK FREDERICK.—(*A communication from
Cauchy Fournier*).—(*Provisional protection only*).—"Im-
provements in apparatus for eyeletting boots, shoes, and
other articles requiring eyelets." A C-shaped standard is
secured to a bench by means of a foot and screw. A hole is
drilled through the lower jaw of the standard and therein
is placed a hollow spindle capable of (by preference) vertical
motion. The lower end of the spindle is of larger diameter
than the upper and forms a shoulder whereon rests the lower
end of a coiled spring. Within the spindle is another spindle
receiving vertical motion independent of the outer one, shaped
like the outer one, carrying a like spring, and projecting
slightly above the upper end of the outer one. Affixed to the
upper jaw are a punch and "adjustable sets to regulate the
pitch of the holes as well as the distance of the holes from
the edge of the material." If the spindles are actuated by
hand, "a bell-cranked lever (its fulcrum forming a part of the
lower jaw of the standard) may be used, the one end being
cam-shaped to suit the required strokes of the outer and
inner spindles, whilst to the other end an ordinary handle is
attached." The apparatus may be worked by "excentrics
connected with an ordinary crank treadle."

An eyelet with its flange downwards is placed upon the pro-
jecting end of the inner spindle; the material is held between
the eyelet and the punch; the handle is depressed; the

spindles ascend; the punch (which is situated directly over the inner spindle) cuts a hole through the material; the eyelet is forced through the hole and clinched by compression between a shoulder on the punch and the outer spindle. The inner spindle remains stationary during the punching and clinching. The eyelet thus fixed "is put upon the set for "regulating the pitch," and the operation is "repeated ad "infinitum." The springs cause the spindles to descend as soon as the pressure ceases.

[Printed, 4d. No Drawings.]

A.D. 1864, December 6.—No. 3041.

CLARK, WILLIAM.—(*A communication from Charles Rhodes Goodwin.*)—(*Provisional protection only.*)—"Improvements "in apparatus for the manufacture of boots and shoes." This invention "consists in mounting boots and shoes on the lasts "by the aid of grippers and cords." Each gripper is composed of (1) a cylinder roughened or grooved at its lower end; (2) a piston working in the cylinder and having the upper end of its stem screw-threaded and the lower end terminating in a disc whose inner surface is roughened or grooved in manner corresponding to the cylinder; (3) a thumb-nut for screwing up the disc; (4) a coiled spring "for counteracting the nut;" (5) a pulley round which a cord passes.

The inventor describes a modification of the foregoing and also a gripper of different construction.

The apparatus consists also of (1) a foot plate; (2) a driving shaft turning in bearings at each end of the plate and carrying pins; (3) levers "oscillating at the upper parts of supports" (fixed in suitable positions on the plate) and furnished each with a sector which slides in one of the supports; (4) holes or eyes in the levers through which the stems of the lasts pass; (5) cords, stretching screws, and hooks.

The action of the apparatus is described, and when the stretching is effected the nailing may be done "on the knee" or "while the last is in the machine."

The inventor describes "the form of support" (for carrying the last on which the boot or shoe is to be mounted when the nailing is "effected on the knee") which he prefers; he also describes an apparatus "in which the levers are arranged on a "circular plate," and one in which the working parts are

“ mounted on a fly wheel.” He adds that the apparatus “ may be varied in form and in the arrangement of the parts for transmitting motion thereto.”

[Printed, 1s. 8d. Drawings.]

A.D. 1864, December 15.—No. 3110.

HANCOCK, CHARLES, and SILVER, STEPHEN WILLIAM.—
“ A new manufacture of certain flexible elastic waterproof sheets, surfaces, compounds, and substances, and the application thereof to various purposes,” among which are enumerated hat, cap, and other bodies, and shoe soles.

These articles are made from either “ an admixture of the milk of caoutchouc and the milk of ballata ” in equal proportions generally, or from a fabric coated with the mixture. If “ pigments, powders, sulphur, or colouring matter ” are to be combined with the mixture, they are to be ground or mixed in water or in flour, paste, size, or gum, and to be stirred into it.

The process of making a sheet from the mixture is as follows :—

On a perfectly flat tablet of plaster or clay float or otherwise distribute an even surface of the compound milk ; when this is dry, float on another, and so on until a sheet of the requisite thickness is obtained. Or float on one milk only, and when that is dry float on the other ; continue alternate coats of the milks. When thoroughly dry raise the sheet at the edge, draw it carefully off, and suspend it in the air to be further dried for use.

Blocks are made by repeating the layers of the mixture, or by rolling sheets into a solid and employing pressure.

Each sheet requires to be brushed over with a mixture of glycerine and water or with pumice powder before a second coating is applied, the surface “ being greasy ” when dry.

Compound fabrics are made by coating fabrics with the mixture or by causing sheets to adhere to them “ by means of hot plates, rollers, or other convenient and suitable methods ; ” if they are to be vulcanized, sulphur must be mixed with the compound milk. Other modes of manufacture are described in the Specification.

[Printed, 4d. No Drawings.]

A.D. 1864, December 17.—No. 3135.

HALL, HIRAM LYMAN.—“Improvements in the manufacture of elastic fabrics.” These fabrics are “non-elastic in one direction;” they are made by combining “parallel threads, network, or other open or reticulated fabrics” with a sheet or sheets of india-rubber placed on one or both sides thereof and united thereto by adhesion and pressure. One or both surfaces of the rubber may be grooved, corrugated, or otherwise figured by means of rollers or other pressing surfaces “so as to present an appearance resembling the ordinary woven elastic fabrics.”

One of the figures in the annexed sheet of drawings represents a piece of such elastic fabric provided with strengthening strips of stout fabric, which may be cemented on to the outer surface or introduced between the two sheets of rubber; the middle strip is placed in a slanting direction, and when the piece is severed along the middle of this strip, “two side springs for a boot will be obtained, the strengthening of the edges serving to hold the stitches which secure the side springs to the upper leathers.”

[Printed, 8d. Drawing.]

A.D. 1864, December 23.—No. 3194.

FAGG, THOMAS, and FAGG, JESSE.—(*Provisional protection only.*)—“Improvements in the manufacture of boots and shoes.” The inventors continue or extend the vamp “to form a lappet or outer tongue or flap with or without a seam across.” The hind part or ankle piece is left open in front; it “meets over the instep” and is covered by the flap and secured thereto “by a flat lace on each side passing through semicircular metal loops on the edges of the flap and on the body of the hind part.” Thus there “is no central lacing over the instep.” The laces are brought from the sides round the back and are tied in front; they are kept from slipping over the top of the boot by a tab on the front and back.

[Printed, 4d. No Drawings.]

1865.

A.D. 1865, January 6.—No. 49.

HASELTINE, GEORGE.—(*A communication from Charles Helms.*)—(*Provisional protection only.*)—"Improvements in "machinery for shaping and trimming the heels of boots and "shoes" by the single operation of turning the boot or shoe "about half way round on the centres on which it is "adjusted."

A standard is adjusted on a table. The standard carries "a "horizontal axis" having on its outer end a propelling pulley and fly wheel and on its inner end a series of knives (forming a rotary cutter) and two rollers, one on each side of the cutter stock. The inner roller acts as a gauge to limit the depth of cut in connection with a pattern plate on the heel; the outer one prevents the cutter "from cutting the counters." The boot or shoe is adjusted on centres (parallel to the axis of the cutter) in a frame which slides up and down in grooves in the face of the standard. One centre engages in the pattern plate, the other in the shank of the last "and thus hold the "shoe with its toe downwards firmly in its place." To keep the frame up so as to bring the heel into contact with the cutter, "the leg of the sliding frame" rests upon a coiled spring, and to depress it when required, a rod, attached to its lower end and passing through the spring, is connected to a treadle. In order to keep the heel firmly in contact with the cutter, "the outer bearing or centre on which the shank of the "shoe is centred is made of flattened steel plate, so that by "means of a rod connecting with it and a hand lever at the "top of the sliding frame the counter of the boot or shoe may "be sprung up and thus cause the cutters to perform their "work accurately." Underneath the outer end of the frame is a hollow standard, in which is a rod resting on a coiled spring, an arrangement which supports the outer end and keeps the frame steady while the heel is being cut.

[Printed, 4d. No Drawings.]

A.D. 1865, January 19.—No. 169.

CLARK, WILLIAM.—(*A communication from Toussaint Landrin.*)—(*Provisional protection only.*)—"Improvements

"in the manufacture of boots, shoes, saddlery, harness, and other articles." The inventor claims an improved method of uniting pieces of leather by means of a solution of gutta percha, india-rubber, or other equivalent.

First:—Considerable pressure is exerted by means of any suitable apparatus, but particularly by the employment of "closed or partially closed matrices enclosing all the parts of the articles" which are to be united by the adhesive substances. Secondly, the uniting adhesive substances are heated by means of a blow pipe and heated air, "which latter has never been before employed for softening the matters employed for uniting leather."

The inventor claims also "forming hollow articles of leather or suitable fabrics by the aid of compressed air acting on an internal elastic core of india-rubber, vulcanized or otherwise."

[Printed, 4d. No Drawings.]

A.D. 1865, January 23.—No. 190.

EADIE, JOHN.—(*Provisional protection only.*)—"Improvements in boots and shoes." These boots and shoes are rendered "more healthful and comfortable" by making them "with provision for ventilating their interiors."

The inner sole is made with a number of perforations or of a material freely permeable; the middle sole is formed with grooves or channels, "which may be arranged in various ways provided they extend to the outer edge at a number of points." If water gets into the boot or shoe, "the heat of the foot aided by the ventilation rapidly dries the small quantity that does not drain off again."

If it is wished "to completely prevent the ingress of water," small tubes of gutta percha or other material are fitted to the grooves; these are "led up over the top of the boot or shoe" sufficiently far to be above the reach of wet; or they may be continued from one side down to the other and have their sides perforated at the upper part.

[Printed, 4d. No Drawings.]

A.D. 1865, February 2.—No. 291.

MURRAY, ANDREW.—"Improvements in the manufacture of boots and shoes, and in apparatus therefor." These

articles are made with welts, partly by sewing and partly by riveting, thereby "uniting all the advantages of sewing with "nearly all the economy of riveting;" the fore part is sewn, the heel is riveted on.

The lasts used are of wood; they have nailed or screwed to them either (1) a heel plate "which lies a little hollow on the "heel," or (2) a "circle plate made in the shape of a horse "shoe extending all round the heel," or (3) a "solid heel "plate to lie flat on the heel." The first and third of the plates may be extended to the waist or up the middle of the last to near the toe, "leaving room to sew and work round the last." The wood of the last is to be filed or cut down to correspond with the plates if necessary.

Directions for making:—The leather is to be well wetted and stretched, then rolled on a board covered with zinc, and then pressed with a heavy roller. "All stuff to be cut "as if for rivets." Welts and all other stuff must be well fitted, the soles well cleaned and thinned in the waist. The bits taken from the waist are to be used "to strengthen the "breast of the heel over the bottom filling, which is to be of "one piece and cut to the shape." The stiffenings "must "be thinned at the bottom where they turn over the heel."

The welts are stamped out; the stamp or knife, "fashioned "to the form of a welt," is applied under pressure. Figures in the sheet of drawings shew the shape of the "welt fitter "or knife," "the heel knife," and "the breast slide of "knife for cutting out heels."

[Printed, 8^d. Drawing.]

A.D. 1865, February 10.—No. 381.

COLES, GEORGE, JAQUES, JAMES ARCHIBALD, and FAN-SHAW, JOHN AMERICUS.—"Improvements in the manufacture "of boots, shoes, and other coverings for the feet." The patentees make outer soles of a union of hard and soft india-rubber combined with a textile fabric. A piece of the size and shape of a sole or sole and heel is stamped out of a sheet of hard rubber compound. Small pieces of any convenient shape are cut out of the sole, and pieces of soft rubber compound are put into the openings "so as to make up the "sole complete again." This sole is covered on one or both

sides with canvas or other fabric. One or more thicknesses of similarly made sole may be added with or without fabric between them. The combination is then vulcanized and may be used in place of the ordinary sole leather. The difference in hardness between the parts will prevent slipping, and the skeleton framing will protect the softer parts from undue wear and tear.

The heels may be made separately in like manner, or they may be of leather.

These soles are usually attached as clump soles. They are sometimes made with an upper so as to serve as a golosh, which may be secured to the boot or shoe by an elastic band passing behind the heel or by means of button or stud holes on the upper and buttons or studs near the waist of the boot or shoe.

[Printed, 8d. Drawing.]

A D. 1865, February 14.—No. 413.

HARTON, GEORGE.—“Improvements in waterproofing skins, hides, and leather,” more particularly when they are intended for boots, shoes, harness, and bands for steam engines.

The skins and hides having been previously tanned are put into a vessel or chamber made perfectly close. The air in the vessel is to be exhausted and there is to be forced into it a solution of india-rubber or gutta percha with the addition thereto of “a small quantity of copal, gum cowrie, or other known and suitable resinous gum insoluble in water, or of a small quantity of wax or spermaceti.”

[Printed, 4d. No Drawings.]

A.D. 1865, February 14.—No. 416.

JONES, ROBERT JOHN.—“An improved system of manufacturing clog soles, patten boards, and similar articles by machinery.” The wood is cut into lengths (by a circular saw) sufficient for one block or sole; and this is “cut up at the heart or centre so as to divide it into two sides or flitches which are squared by the circular saw to the required size for a block.” If the sides make more than one block, material is saved “by cutting the blocks wedge-shaped in the deep-cut way.” The block is then taken to—

"The shaping machine" for "forming the inside:"—The block is held on a sliding table by any suitable contrivance; it slides over or under a shaft having secured on it a chuck to which cutters are fastened by set screws. The cutters revolve and shape the inside. "In right and left hand soles "the rise of the instep may be left full on the inside" by placing the block diagonally with the chuck.

A machine for cutting to shape the edges of blocks:—Templates are "fixed flat on sliding tables," and the blocks are held on the templates at the toe and heel. The templates "are formed for enabling half the length of the edges to be "cut by one cutter at each side and the other half by another "cutter at each side, one pair of cutters revolving in an "opposite direction to the other pair;" but the cutters may all revolve in the same direction. "Four vertical rods" are fixed to a frame; they carry four swing frames, "held "together at the top by springs" and having "vertical "shafts" whereto are fixed bevelled cutters and rollers. On each rod is a four-grooved pulley; two grooves of each are "connected by bands from the driving shaft;" the others "are connected by bands to the pulleys on the vertical shafts." The working of the machine is described. To keep the machine in full work there are several tables with blocks fastened thereon, so that as one table leaves the machine another enters.

A machine for "sinking the heel and cutting out the shank":—Revolving cutters are fixed to a chuck on a shaft, whose bearings are "fitted to slots or guides in the framework." The chuck carries also side cutters "for assisting in working out the "shank." By means of rods linked to the ends of the shaft and jointed at the top to an arm, the cutters can move up and down as they revolve. The blocks are held on a sliding table whereto is fixed a template for working the cutters up and down.

"The bottom of the heel and the treading and toe parts" are shaped by "revolving cutters of the size and shape "required." The cutters are fixed to a chuck, and the blocks are held on a sliding table.

The heel is rounded by cutters secured on a revolving chuck. The chuck is fixed on a shaft working in bearings in the framework. The sole is held in a gauge block which

works on a pin in a slide in a table, the table being "inclined "to suit the bevel of the sole." The table is drawn up to the cutters and is "worked round in a semicircular "direction." If the heel requires more bevel at the back than at the sides, the toe is "to be raised in proportion in "the gauge block." If the toes require to be rounded, they are acted upon in like manner.

The grooving of the sole for the upper leather is effected "by means of a circular cutter or saw having a V shaped "edge, with another circular cutter or saw underneath, or "at the top with a bevel edge." These cutters or saws "may be in two parts if desired or otherwise combined to "form a groove of the required shape." Or the sole may be grooved "by revolving flat cutters of a V and bevel shape, "either combined or separate, and wedged or otherwise "secured to a suitable head." The cutters are fixed to a shaft provided with a pulley. The sole is pressed against gauges and "worked round by the hands of the operative."

The sole is completed "by hollowing the inside to fit the "foot;" this is done by means of cutters secured to "chucks "of a radius to suit the curve required."

Blocks may also be shaped "by securing them to a revolving "table working under revolving cutters." The table has "projections forming serrated seatings" for one end of the blocks, the other end being pressed tight by screws or wedges. The blocks "are shaped at their insides, outsides, and edges, "according to the shape of the cutters."

Modifications of some of the foregoing arrangements are described in the Specification.

[Printed, 10*d*. Drawing.]

A.D. 1865, February 16.—No. 442.

BROOMAN, RICHARD ARCHIBALD.—(*A communication from Alexandre Leverd.*)—"Improvements in the manufacture of "boots, shoes, and other like coverings for the feet." In the manufacture of these articles "stitching (except in the uppers), "screws, rivets, and nails are dispensed with."

The insole is of gutta percha having pressed on (under heat) its inner side a covering of linen, cotton, &c., and a piece of stuff placed on the covering, the edges of the stuff being turned

over under the gutta percha surface and fixed thereto by heat or cement. The insole is put on a last with the stuff side against the sole thereof, and the edges of the upper are temporarily secured to the insole and then tacked thereto. The outer sole (of leather) is stamped or cut out in one piece from toe to heel; the inner surface is roughened, and sometimes the sole is tacked "to increase the adherence of the gutta percha." The upper (with its insole and the outer sole applied thereon) is put into "a moulding apparatus." A core to form the body of the heel is put into the mould; gutta percha in a plastic state is poured in; this, "interposed between the inner sole "and the leather sole," unites the whole and completely surrounds the core "except at bottom where the leather sole extends." Or the heel may be entirely formed of leather, cork, or other material.

If it is desired "to cover the whole of the heel with leather," the leather sole "is thinned on the edges of one of its sides to "increase the adherence with the inner sole by means of the "gutta percha." The sole thus thinned "is cut with a tail "piece" and united to the leather heel by a seam. "The "heel proper of wood, cork, or other material is placed in the "interior of the heel, "which is cut of the contour" and "formed into the shape" shewn in two figures in the sheet of drawings.

Sometimes to further secure the outer sole to the upper a seam is run "round the periphery of the sole."

[Printed, sd. Drawing.]

A.D. 1865, February 21.—No. 484.

BAULCH, CHARLES.—"Improvements in machinery for sewing or uniting leather and other hard substances particularly applicable to the manufacture of boots and shoes." The patentee claims (1) the combination and employment of "two piercers and a needle;" (2) apparatus for causing the boot or shoe "to move into proper position as the sewing is performed;" (3) the employment of "a winder or drum," which "receives the thread from the needle, and drawing it "tight completes the stitch, at the same time preparing the "wire point for the next stitch." The material for sewing may be "a hemp thread waxed, or wire, or wire and hemp "combined."

1. A sliding plate connected to the standard or bracket "has two upper and two lower arms which act as guides to the rods of two piercers." The piercers "are placed at an angle to each other;" they have a rotatory as well as an up-and-down movement. In gear with the sliding plate is a rod "connected to a rocking lever to which is attached a spindle carrying a needle." The piercers and the needle move alternately, according as a "half-gear wheel gears into their respective crank wheels." The needle "works parallel to one of the piercers and enters the hole made by that piercer." The lower part of the sliding plate carries the presser foot.

2. Attached to the table is a bracket "carrying between centres a frame," which carries "a second frame also on centres so that its end may be moved in any direction."

This second frame "has at its end, one above another, two bearings in which a spindle is free to move;" this spindle "has at the lower end a drum and plate," and at the upper end "a plate with a dove-tailed plate on its surface, so that the last with the boot or shoe" (the leg of the last having a corresponding dovetailed slide) "can be slid in and when pushed in tight be in its place." To move the boot or shoe the length of the stitch, a chain or cord is passed round the drum; the ends "are carried to two drums, round which it is wound alternately, as required, according to the direction in which the boot is to travel."

3. The winder is a conical drum having (1) "spokes for pushing off the thread or wire" and grooves for the spokes to slide in; (2) a rod moved by a handle for working piercers which "clip and cut the wire point," and for "drawing the winder into position and gear;" (3) a shaft carrying "at the opposite end to the winder" a cog wheel which can be brought into gear with a cog wheel on a shaft in the upper part of the machine; (4) a tightening screw; (5) a "disconnection or break in the shaft to allow of one part moving while the other remains stationary."

The last with the boot or shoe thereon is placed in position; the piercers, descending through the sole and upper and a channel formed in the last, make two holes in the leather; they rise; the needle enters one of the holes; the point of the thread used "is passed by hand" through the other hole and *through* the eye of the needle; the needle rises and draws up *the thread* which is received by the winder.

[Printed, *Ed.* Drawing.]

A.D. 1865, March 7.—No. 637.

AUBERT, ALEXANDRE EUGENE ADOLPHE and GERARD, GUSTAVE EUGENE MICHEL.—“Improvements in the manufacture of shoes and other coverings for the feet.” The uppers are made of leather and the outer soles of vulcanized india-rubber.”

The sole is made of caoutchouc and sulphur only, or with the addition of other substances “to increase the bulk of the compound” or fibrous substances “to give the compound less elasticity and more tenacity;” it may be either stiff or supple “according to the composition and hardness of vulcanization.” The sole is formed in a mould, and “the stiffener, the heel, and all the parts of a complete sole are obtained in a single piece;” it may be attached by sewing, pegging, screwing, riveting, or otherwise.

Goloshes are made by nailing uppers on to the edges of “harder soles.”

Some soles are made flat on their edges; others with a raised flange “to facilitate sewing;” others with a groove on the edge “to hide the thickness of the leather of the upper.”

[Printed, 4d. No Drawings.]

A.D. 1865, March 14.—No. 710.

EVANS, GEORGE.—(*A communication from James Dunbar.*)—“An improvement in heels for boots, shoes, and other like articles.” These heels consist of “two main parts;” the upper part is a metal frame to be screwed or otherwise attached to the boot or shoe; the lower part is a block of vulcanized caoutchouc, cork, or other suitable substance, to be fitted into the frame and removeable therefrom when required. The sides of the frame taper from the top downwards “in order to ensure a good hold upon the filling,” and the upper parts of the sides of the filling are shaped to correspond with the inner surface of the frame.

[Printed, 8d. Drawing.]

A.D. 1865, March 18.—No. 766.

ROBINSON, OWEN.—(*Provisional protection only.*)—“Improvements in sewing machines,” known as shuttle or lock-stitch machines.

1st improvement:—"The wheel feed" is placed so as to work on "the right-hand side" of the needle, thereby allowing the operation of "goloshing the uppers" to be performed "more easily and expeditiously."

2nd. The feed wheel is driven by "a crown ratchet wheel" into the teeth of which a spring pawl carried by a reciprocating lever works."

3rd. A wheel feed is placed "with its axis transverse to or at right angles with the longitudinal axis of the arm or cylinder" in that class of sewing machines," so that the material may be fed in the direction of the cylinder.

4th. The presser foot is lifted, by means of a bell-cranked lever actuated by a cam, "after each stitch in those sewing machines wherein the wheel feed is employed in order to facilitate the turning of the work."

5th. The shuttle driver is actuated by being jointed to one end of a connecting rod which is jointed at its opposite end to a vertical vibrating lever worked by a grooved face cam.

The inventor proposes "to place the shuttle in its race with its nose pointing in the direction of the outer end of the cylinder or arm, so that it shall catch the loop of the needle thread when it is moving outwards or towards the outer end of the arm or cylinder."

Again, he proposes to place the main driving shaft "at right angles to the longitudinal axis of the arm or cylinder;" and "to carry it completely through both sides of the table;" the cams for giving motion to the needle and shuttle are to be "grooved face cams."

[Printed, 4d. No Drawings.]

A.D. 1865, March 21.—No. 784.

GOURLEY, DANIEL.—(*Provisional protection only.*)—"Improvements in the manufacture of boots and shoes." The first improvement consists of "a peculiar fastening," which supercedes the use of laces, side springs, and other modes of fastening boots and shoes. The fastening is a band of leather or other material "passing over the annular ligament and fastened by a buckle or other suitable fastening."

The second improvement consists in protecting the sole of the foot "from injurious contact with hard roads," &c. by

means of an elastic material placed between the inner and outer soles.

[Printed, 4d. No Drawings.]

A.D. 1865, March 31.—No. 908.

POOLE, JOHN, and BROWN, THOMAS.—“Improvements in “ socks, soles, or feet protectors to be used loose in boots and “ shoes or affixed thereto.” The patentees make their socks of wood, preferably pine; this they saw into thin leaves “ similar to that known as scaleboards,” cut or stamp into shape, and cover or not on one or both sides with paper, leather, caoutchouc, or woven or felted fabric.

The wood and the covering may be cemented together either in the sheet, or after each has been cut into shape. The socks are steamed, sewn round the edges, and passed between rollers or presses.

[Printed, 4d. No Drawings.]

A.D. 1865, April 11.—No. 1034.

NICOLL, BENJAMIN WILLIAM LESLIE.—(*Provisional protection only.*)—“An improved flexible spring waist for boots and “ shoes.” At the waist, between the inner and outer soles, there is formed a bed to receive “a metal arch and abutment.” The arch is by preference of tempered steel; at the front end there is a slot with an enlargement therein; this end is partly or wholly enclosed in a flat metal sheath which is riveted to the sole. The sheath is “cut and raised so as to receive the “ slotted end” and allow room for it to slide to and fro therein, the front end being held in position by a stud in the sheath which enters the slot. The hinder end of the arch is “made “ of increased width and riveted to the heel of the inner “ sole.”

[Printed, 4d. No Drawings.]

A.D. 1865, April 12.—No. 1050.

NEWTON, WILLIAM EDWARD.—(*A communication from Daniel Franklin Packer.*)—“Improvements in elastic “ binders [for boots and shoes.” This invention relates to a method of fastening boots and shoes, namely by means of

elastic binders or laces ("round, polygonal, or flat") and "bill-shaped buttons."

At the top and bottom of the lacing part there is fixed a semi-circular tube or a hook for the reception of the ends of the lace, the ends carrying a knob or tied in a knot. There is a row of buttons on each side of the lacing part, "with their bills projecting outward so that they prevent the binder from disengaging spontaneously." The lace when wound round the buttons will "accommodate itself to the motions of the foot and ankle."

A lace "partially elastic and partially of the usual non-elastic string or cord" is recommended for heavy shoes.

[Printed, 6d. Drawing.]

A.D. 1865, May 12.—No. 1318.

HASELTINE, GEORGE.—(*A communication from William Emerson Baker.*)—"Improvements in the manufacture of boots and shoes." The object of this invention is "to facilitate the manufacture of such shoes as when finished have no inner soles entering into their construction," although they may have a light insole pasted or cemented therein for the purpose of finish.

A metallic inner sole is used for lasting; it is of such form and size with respect to the outer sole that the stitches uniting the vamp and the outer sole "are formed outside of and equidistant from the edge of the metallic inner sole." This sole has pins projecting from its outer face, usually one near the toe, one near the middle of the heel, and one midway between the two; they hold the basting thread and keep the outer sole in position, being made (for the latter purpose) with a screw and nut or with a slide and screw.

The vamp is drawn over a last and over the edges of the metallic sole; its opposite edges are laced or basted by a cross-ing thread; the outer sole is clamped to the metallic sole by the pins; the last is taken out, and the article is then in a condition to be sewn, the needle "passing just outside of the false sole and through the contiguous edges of the vamp and outer sole."

"Spurs," fixed in the metallic sole and "extending through the vamp and some distance into the sole," prevent any

“ lateral movement of the upper with respect to the sole when
“ the last is removed.”

“ In the manufacture of some styles of boots and shoes it is unnecessary to employ “ an inner sole either of metal or other
“ material.” The invention comprises other methods of confining the edges of the vamp upon the last and of temporarily uniting the vamp to the outer sole.

[Printed, 6d. Drawing.]

A.D. 1865, May 12.—No. 1327.

DAVIS, THOMAS.—“ Improvements in vessels for containing
“ blacking, polishing oils, and other similar materials, and in
“ apparatus connected therewith.” The vessel, (by preference) cylindrical and of earthenware, is fitted with a lid capable of being easily rotated thereon by means of a knob or handle. In the periphery of the lid is a notch into which passes the upright stem of a stirrer shaped thus (L). The horizontal part rests upon the bottom of the vessel, and when the lid is rotated scrapes the bottom and thereby mixes the contents without removing the lid. Inside the vessel is a float, notched to fit the stirrer and so rotate with it, perforated to allow the contents to pass through, and slightly dished on its upper face so that a small quantity of the contents may rise and fill the dished portion. “ By dipping the blacking or other brush
“ into the liquid contained on the float, no more will be taken
“ up by the brush than is required at one time, and hence all
“ waste is avoided.”

The lid may be made to screw on to the vessel, so that the mixing will be effected by the unscrewing. There may be two upright stems to the stirrer and a notch on each side of the periphery of the lid and of the float.

[Printed, 8d. Drawing.]

A.D. 1865, May 16.—No. 1351.

BROWN, WALTER.—(*Provisional protection only.*)—“ Improvements in machinery for manufacturing clog and patten
“ soles.” The inventor claims “ improved tools or instruments for holding the blocks of wood” and “ improved
“ arrangements of rotary cutters for cutting clog and patten
“ soles entirely or to a great extent in the direction of the
“ grain of the wood.”

The blocks are held in clamps, each provided with a jaw or jaws to fit soles of different lengths; the clamps "are traversed " along a table by a screw and nut," or other means.

The cutters are arranged in pairs revolving in contrary directions; they are mounted "in swivel bearings jointed to " swivel arms jointed to the table." The arms are drawn by springs towards each other and against fixed templates of the shape of the portion of the sole under operation. The cutters operating in succession impart the required shape to the blocks, and when the edges have been cut, "the blocks are " turned one-fourth round to bring the top or bottom in line " with the cutters." Or the top and bottom may be cut first and the edges afterwards.

In making right and left soles one portion of the edge should be left thicker than the other; for this purpose "a " template must be applied at each end of the cutter spindles" to give the proper inclination to the cutters.

When the top, bottom, and edges are cut, the heels are completed in an apparatus similar to the one for which Letters Patent were granted to Mr. Brown dated 30th March 1859, No. 790, "but with certain improvements," namely "a tool " for finding the centre of the heel and for regulating the " distance it has to swivel." This tool is provided with "two " right and two left-handed screws acting on slides fitting in " a grooved stand." When the centre is found, "the sole is " held between two centres which are brought towards each " other by eccentrics," and the heel can be tapered off at the " back by supporting the sole on a beveled block fixed to one " of the centres."

The groove in which the upper leather is secured is cut in the manner described in the before-mentioned Letters Patent.

[Printed, 4d. No Drawings.]

A.D. 1865, July 18.—No. 1868.

WINT, JOHN PUSEY.—"Improvements in instruments used in " cutting the soles of boots and shoes." This instrument is proposed as a substitute for the knife and piece of horn hitherto used for paring the edges of soles.

The instrument consists of (1) a handle; (2) a groove or recess at the end or head "through which the shavings get " away;" (3) a flange or projection which enters between the

upper and the sole, "forms a guard, and acts to polish the " edge;" (4) a cutter, fixed to the handle by a screw (which passes through a slotted hole in the cutter) and capable of adjustment to cut a thick or thin shaving from the edge of a sole.

The cutter may be made with a stem which passes into a socket and is fixed therein with a screw. The cutter "may be made with a single or a double cutting edge"; in the former case it will cut only when moved in one direction, in the latter it will cut when moved to and fro.

[Printed, *8d.* Drawing.]

A.D. 1865, July 25.—No. 1931.

JOHNSON, JOHN HENRY.—(*A communication from Van Wagener.*)—"An improved mode of lacing boots, shoes, and " other articles united by laces." This invention consists of a substitute for the ordinary eyelet. The substitute is a metal loop or staple; it is made of wire bent into the shape of a loop; the ends "terminate in flat annular washers"; the loop is at right angles to the washers.

Holes are punched in the article to be laced; the washers are placed one on each side of each hole, so that the loops "stand " out from or project over the edge of the parts to be laced"; and the washers are secured "in any of the following modes:"—(1) by inserting an eyelet through both washers and riveting it down on them; (2) by forming an eyelet in one washer and passing it through the opposite one; (3) by passing a solid pin through both washers and riveting it over them; (4) by making the end of one washer a rivet bent at right angles, passing it through the other, and riveting it.

In order to fasten the loose end of the lace one of the top-most loops may be made double. "The whole of the loops " on one side of the boot may be double, the single loops on " the opposite side entering between such double loops when " the lace is drawn tight."

[Printed, *8d.* Drawing.]

A.D. 1865, August 3.—No. 2017.

ANDERSON, LUKE.—"Improvements in machinery to be " used in the manufacture of horse shoes, shoe heel and toe " tips, and other similar articles." This machinery "may

"be driven by any suitable power and may be geared in any suitable manner."

A pair of steel rollers are mounted in standards; the upper one is grooved on the face to receive the iron. Punches driven into the groove make the countersinkings required for the nails. Cutters (three or more according to the size of the roller), dovetailed across the groove and kept in place by collars which are tightened by nuts, cut off the length required for each article. The position of the under roller may be varied by adjusting screws "to admit the insertion of another size of upper roller." Each length, when cut off and countersunk, passes from the rollers on to a disc or table "partially revolving in a reciprocating motion half round and back upon a vertical shaft or spindle." The head of this spindle carries a template of the form required to be given to the article "by suitable guides." The article is bent round the template, after which "by the action of a cam upon the main shaft of the machine working levers attached to the template spindle, the template itself is withdrawn through an opening in the disc," and the article is allowed to fall.

[Printed, 10d. Drawing.]

A.D. 1865, August 18.—No. 2132.

CARTWRIGHT, MATTHEW, and DALE AUGUSTUS.—"Improvements in applying elastic material to boots, shoes, and such like coverings for the feet." The patentees make spring side and front pieces from sheet india-rubber. They cut out suitably shaped pieces of rubber and fasten the edges (except the top edges) of two pieces together by interposing a strip of cotton or similar fabric, "which will follow the edges" and is coated on both sides with adhesive solution. The whole is then pressed together by rollers. The top edges are protected by doubling the edge of one over the edge of the other, uniting them with solution, and pressing them together. Or the piece may be cut of such a shape that it may be folded and have the doubled portion at the top for a top edge. When the spring piece is thus prepared, it is to be vulcanized, when it is ready for use; it is attached to the boot or shoe by sewing.

In some cases "a central or mid-line strengthening strip" of cotton or other non-elastic substance is introduced. Perforations, eyelets, &c. may be added for ornament; or the pieces may be stamped or embossed.

[Printed, 4d. No Drawings.]

A.D. 1865, August 18.—No. 2133.

LAWRENCE, PHINEAS. — (*A communication from Jacob Nichols and Moses Pettes.*)—"Improvements in boots and other coverings for the feet, which improvements are applicable also to trunks and other articles for the purpose of strengthening, preserving, or protecting them." The object of this invention is to provide a "substitute for the nails, screws, or plates heretofore inserted into or under the soles and heels of boots, shoes, and other foot coverings."

The proposed substitute is a stud (by preference of cast or chilled iron) consisting of "a short, cylindrical, conical, concave, or convex body," at one end of which is a flange bevelled on its under surface. The flange may be dispensed with in certain cases, as for example "in some india-rubber articles when a concave stud is used;" such a stud will hold securely without "the aid of backing."

The undermost or outermost portion or layer of the sole and heel is perforated for the reception of the studs, and the studs are inserted with their flanged ends uppermost before such portion or layer is fixed on by sewing, pegging, or other means. The bottom surfaces of the studs may lie flush with the under surface of the sole and heel or be countersunk therein or project therefrom.

In the annexed sheet of drawings are figures representing studs of different shapes.

[Printed, 8d. Drawing.]

A.D. 1865, September 13.—No. 2339.

DUNBAR, JAMES. — (*Provisional protection only.*)—"Improvements in the construction of boots and shoes." This invention consists in protecting the bottoms of trouser legs from mud and wear; this the inventor accomplishes "by cutting away the lower portion of the outside of the heel, the cutting being highest at the back," and applying an

inclined surface or shield "above and around that portion " of the heel coming in contact with the ground." The mud is thrown on to the under side of the shield, and the trouser legs are prevented from getting underneath the heels.

The heels instead of being cut away may be made in two or more pieces, the lower portion being of india-rubber, metal, or other material. The lower portion may be hollow for the reception of a piece of suitable substance, which when worn can be easily turned or replaced.

[Printed, 4d. No Drawings.]

A.D. 1865, September 21.—No. 2410.

HIBLING, HENRY.—"Improvements in the manufacture of " boots and shoes." The patentee fixes the outer sole to the upper in such manner that the upper ends of the rivets, screws, or pegs used are "entirely outside" of the boot or shoe instead of "inside as heretofore."

The welt is sewn to the upper so that "when the edge of " the upper is turned down, the sewing is inside the boot," and the edge of the welt projects outside the upper. The outer sole is then fixed on so that the fastenings used pass through it and the projecting edge of the welt. After fixing on the outer sole the insole is inserted "so as to cause the " upper to lie over the projecting welt in the proper manner."

[Printed, 6d. Drawing.]

A.D. 1865, September 22.—No. 2428.

WHITE, CHARLES, and WHITE, THOMAS.—"Improvements " in socks for boots and shoes." These socks are made of "some soft and cheap wood, such as pine," sawn or planed to the required thickness and stamped or cut out into shape. The socks may be covered if necessary with leather, linen, flannel, fur, or other material, glued, cemented, or sewn on. These socks are recommended for use inside pegged or riveted boots and shoes.

[Printed, 6d. Drawing.]

A.D. 1865, September 25.—No. 2449.

COBURN, JOHN WIGGINS.—"An improvement in the manu- " facture of waterproof soles for boots and shoes." These soles are composed of india-rubber "with an edge of leather

“around it.” A mould is constructed of form and size suitable for a whole sole and heel, another for a half sole. A narrow strip of sole leather, coated on the inner edge with “common rubber cement,” is put into the mould round the edge, and the space within is filled with india-rubber “clear, “fabricated, or any of its compounds or equivalents.” The sole is cured in the ordinary manner and is attached to the boot or shoe by sewing or pegging through the leather rim.

The rubber is by preference made a little thicker than the leather rim. The outer surface of the rubber may be corrugated or roughened. A thin sheet or coating of india-rubber may be applied between the outer and inner soles “so as to “cover the leather edge and render that portion of the sole “also waterproof.”

[Printed, &c. Drawing.]

A.D. 1865, October 13.—No. 2640.

CARTWRIGHT, MATTHEW. — “Improvements in elastic “fronts, sides, and backs for boots and shoes.” These springs are made of solid india-rubber bordered around (except on the top) with canvas or other fabric.

The india-rubber is either cast into shape or cut from sheets. The margin is strengthened and rendered non-elastic by cementing thereon canvas or other fabric, either on one or both sides. The cement used is india-rubber solution with the addition of gutta percha, asphaltum, or “other gummy material capable of hardening the rubber on the border of the “spring, which prevents its stretching and thereby gives “firmness and security to the stitching.”

The invention admits of modifications:—The canvas may be imbedded in the rubber. The spring may be formed of two pieces of rubber with a border of canvas between. The margin may be hardened by gutta percha, asphaltum, &c. alone without canvas. The surfaces of the springs may be covered with elastic woven fabric.

[Printed, &c. Drawing.]

A.D. 1865, October 25.—No. 2750.

HASELTINE, GEORGE. — (*A communication from John Chipman Hoadley.*)—“An improved mode of uniting pieces “of leather, more especially adapted to the manufacture of

"boots and shoes." The vamp, insole, and outer sole are united by means of "pegs formed of thread or other similarly flexible material."

The thread before being waxed is saturated with a solution of glue or other like substance, and the superfluous solution is removed by drawing the thread through holes in a plate "in a manner somewhat resembling the process of drawing wire." The thread when dried is wound upon a reel and afterwards cut into pegs of any required length. Wax alone may be used to stiffen the thread. Or the pegs may be obtained from a saturated sheet of fibrous material; they may be square or round in section and tapered towards each end, and may be inserted by hand or a pegging machine. In either case "a peg tube is advantageously employed;" it is provided with a gauge "to regulate the distance of the holes from the edge of the sole."

One figure in the sheet of drawings shows the shape of the awl which the inventor prefers to use; it is "of a round sectional form with a round or piercing point so as to displace the leather by punching instead of cutting it; for square pegs it must be "of the same sectional form as the pegs." The pegs are driven in with a driver, or if the thread has been properly prepared, "by a simple hand hammer without the aid of a peg tube."

A groove should be made in the last in the line of the pegs, and the projecting ends are removed by cutting or rasping.

Figures in the sheet of drawings exhibit "various methods of applying the thread pegs."

[Printed, 8d. Drawing.]

A.D. 1865, October 28.—No. 2785.

GOODMAN, CLAUDIUS ERSKINE.—(*Provisional protection only.*)—"Improvements in machinery employed in the manufacture of boots and shoes," that is to say in forming and finishing the edges of soles and heels. "A clamping apparatus," made in two halves longitudinally (but the number of parts may be varied), is mounted on a revolving chuck. This apparatus protects the upper whilst at the same time it "acts as a template in controlling the action of the cutter;" its edges "pass in between the sole and the upper." The

chuck is arranged "to slide on the end of its shaft," so that the edge of a sole is "by the rotation and sliding of the chuck, "together with its having the capability of being moved to "and from" a stationary cutter, constantly presented to the cutter and has a shaving cut off. It is desirable that the sole and heel be roughly cut to the desired shape before the boot or shoe is introduced into the machine.

The chuck is by preference oblong with semicircular ends; it is provided all round with a rack into which a pinion gears. The pinion is carried by an axle which receiving rotary motion from any power gives motion to the chuck. Other forms of eccentric chucks may be used.

The frame carrying the shafts or axles is mounted on another shaft, so that the frame, the chuck, and the boot or shoe "can "by means of cam surfaces be caused to assume various positions."

"The foregoing apparatus is mounted on a sliding frame "driven by a suitable cam," so that "the bottom of the sole "is during its rotation maintained at the same distance from "the rest."

The cutter is fixed on a stationary rest.

[Printed, 4d. No Drawings.]

A.D. 1865, November 6.—No. 2861.

FLUDE, ROBERT.—"Improvements in means and apparatus "for finishing the soles of boots and shoes." The patentee claims the invention of two machines and such modifications "as may be identical therewith or identified by the description "thereof," one for finishing the edges, the other the bottoms of soles and heels.

1. A shaft is mounted in a stand or frame; it may be turned by treadle, hand, or other power; it carries two discs, one for finishing the edges of the sole, the other the edges of the heel. The peripheries of the discs may be plain, or notched, or corrugated, or indented. Each disc is provided with a "guard "feather" held in place by a collar which is fixed to the shaft by a set screw. The feather rotates independently of the disc; its periphery "travels along the channel between the sole and "upper as the boot or shoe is moved, and thus keeps the edge "of the sole in the required position against the periphery of "the disc." The discs may be heated externally or internally.

The discs and shafts may be mounted in a horizontal, vertical, or inclined position.

2. An endless band, having its face covered with emery, glass, or other equivalent, passes over drums horizontally or vertically. The bottom of the sole or heel is brought into contact with the face and is thereby dressed and finished. This machine may be driven by any power.

[Printed, 10d. Drawing.]

A.D. 1865, November 8.—No. 2877.

MOLE, CHARLES.—“Improvements in the manufacture of “boots and shoes.” The improvements relate to the heels, which are so constructed that the lower portion can be turned one quarter (or less) round so as to bring an unworn part into wear.

The heel is made in two parts, and a plate is fastened to the under side of the upper part, and a similar plate to the upper side of the lower part. In the middle of one of the plates (“the “top or bottom one indifferently”) there is cut “a square hole “passing either through or only partially through the thickness of the plate,” and on the other is formed a projection, “the shape of which will be the exact counterpart of the hole “in the first-mentioned plate.” The two parts of the heel are united by a pin passing through a hole in the middle of the lower part of the heel. This pin may form part of the top plate, in which case its shoulder may form the projection to take into the square made in the lower plate; its lower end will be threaded to receive a nut, which when the plates are brought close together will be countersunk in the bottom of the heel. Or the pin may pass up from the bottom of the heel, in which case its head will take the place of the nut, and the pin and holes in the squares will be screw threaded. When a nut is used, it has a slot in opposite sides that it may be unscrewed with a key.

In order to turn the heel less than a quarter round, the sunken hole and the projection are made “sexagonal, octagonal, “or of more sides.”

The patentee claims any variation or modification of the foregoing arrangement which may be made without altering the principle of the invention.

[Printed, 8d. Drawing.]

A.D. 1865, November 11.—No. 2910.

JONES, DAVID ADAM.—(*Provisional protection not allowed.*) —“Improvements in the manufacture of socks or inner soles “for boots and shoes.” These socks are made of “light porous wood” in one or more pieces; they are covered with leather, cloth, or other material attached by cement or sewing. If the socks are to be waterproof, the wood is covered on one or both sides with “any convenient waterproofing material.”

[Printed, *4d.* No Drawings.]

A.D. 1865, November 13.—No. 2916.

FELT, NATHANIEL HENRY.—(*A communication from John Gillingham Felt.*)—(*Provisional protection only.*)—“Improvements in machinery for cutting and rounding boot and “shoe soles of leather and other analogous substances.” A cast-iron table has a flat top “furnished with tracks or ways,” which are raised about one-eighth of an inch above the surface and planed that the carriage carrying the cutter may slide easily thereon. There is a groove through the top of the table between the inmost track and a plate whose edge “is “parallel with the track” and whose surface “is flush with “the same.” From and above the plate “a start” projects. A vertical shaft passes through the plate and start; its upper end passes through a hole in the middle of a removable pattern; its lower end carries a pinion in gear with the rack of a sliding bolt, so that the pattern (which rests on the shaft) can be turned “when it is required to cut the heel and toe “alternately.” A coiled spring keeps the pattern up when not pressed upon from above by a clamp of contour resembling the pattern but slightly smaller. The clamp has round its bottom edge a row of conical points which press into the material; it is raised and turned by a shaft which enters a hole in its middle, passes up through a cross bar, and is moved by a lever. A chain belt passes round pulleys “under “the table and approximately parallel with the groove”; it is moved by a crank handle in gear with the lower end of one of the pulley axles. The travelling carriage rests on the tracks; its “inner point extends a little beyond the groove;” its under side carries two friction rollers “which travel in the groove,”

guiding the carriage "and keeping it at right angles" thereto. Between the rollers a pin projects downwards, which connects the carriage to the chain belt. A plate "slides on" "suitable ways on the top of the sides of the carriage;" it is kept in place by cleats and is pressed towards the pattern by a spring. A block, "fitted into a corresponding slot in the" "end of the slide," turns on a pin "so as to give any required" "inclination to the rounding knife," whose shank "is round" "and turns freely in its bearings on the end of the block."

A full description of the machine is given in the Specification.

[Printed, 8d. Drawing.]

A.D. 1865, November 24.—No. 3019.

MORETON, GEORGE.—"Improvements in lacing boots and" "shoes," whereby the lacing portion is "rendered more" "perfectly waterproof."

The tongue is placed outside instead of inside; it may be cut in a piece with the upper or be separate and inserted with stitching into the waist seam. The facings which carry the eyelet-holes are sewn to the side leather by one edge only.

In lacing, the leather constituting the sides is brought together, then over this the facings, and finally the tongue; "the whole is bound by the lace as usual, presenting a more" "neat and tight arrangement than when the tongue is placed" "on the inside."

[Printed, 6d. Drawing.]

A.D. 1865, December 9.—No. 3170.

JACKSON, WILLIAM.—"Improved arrangement of the parts" "in sewing machines for using wax thread for sewing on the" "soles of boots and shoes." The patentee claims, "firstly" "and specially," an arrangement "for working a thread con-" "ductor in combination with an arm," whereby he dispenses "with wheels or a joint which has in all cases before been" "used for the aforesaid purpose." The thread passes from a bobbin through the upper end of a rod carried in a horn and through a needle hole in the upper end of the horn. An eccentric on the main shaft actuates a vertical rod which connects the eccentric to a cam on the lower end of the rod

carried in the horn. A cup-and-ball joint at the lower end of the connecting rod causes the cam and its rod "to work together backward and forward, and partly with a circular motion, and for putting the thread into the barb of the needle when the needle has descended to its lowest point."

In the other arrangements claimed by the patentee, the needle bar and the looper bar work vertically and parallel to each other, the former actuating the latter by means of tappets. The lower end of the looper bar is bent and pierced with a hole "to permit the hooked needle to pass through it, and for the purpose of protecting the last preceding loop from being caught in the hook while sewing." The looper bar carries a spring which permits it "to yield according to the thickness of the material to be sewn;" and a screw, "having leather between the looper bar and the screw end," allows of more or less friction, as it is necessary for the bar "to rest for a time to release the thread from the hooked needle." The disc, which works the connecting rod in communication with the needle bar and the looper bar, has part of its face "recessed for the purpose of propelling" the presser foot and its bent rod and a pin and roller, "which are all attached to each other for giving the required length of stitch."

[Printed, 1s. 2d. Drawings.]

A.D. 1865, December 18.—No. 3263.

DICKSON, JOHN FARMERLEY, and BARRS, JOHN.—(*Provisional protection not allowed.*)—"Improvements in utilizing scraps or small pieces of leather." It is proposed to use the waste pieces which abound in the manufacture of boots and shoes. Two or more pieces are connected by notching or dovetailing into each other, and the union is strengthened by means of paste or cement.

These united pieces may be applied in the manufacture of heels and other parts of boots and shoes.

[Printed, 4d. No Drawings.]

A.D. 1865, December 19.—No. 3270.

BOLTON, JAMES.—"Improvements in the manufacture of boots and shoes for rendering them waterproof." A layer of American leather cloth or of india-rubber cloth or other

waterproof cloth is placed between the upper leather and lining. A layer of one or more of the foregoing, alone or in combination with a layer of asphalt roofing felt, or a layer of the last-named alone is put between the insole and the outer sole. A solution of gutta percha or other substance not soluble in water is applied to fill the holes made in lasting, and the outer sole is fastened on with pegs or rivets.

[Printed, 4d. No Drawings.]

A.D. 1865, December 19.—No. 3273.

THURGAR, AUGUSTUS HENRY. — (*Provisional protection only*). — "Improvements in foot protectors," to be called "The railway traveller's foot protector." This article forms a "case of a size convenient for carrying in the coat pocket" or travelling bag. It consists of "two pieces of leather or other suitable material of about the length and breadth of a person's shoe"; on the one side is attached "the fore part of a shoe, lined and covered with fur, wool, or similar material," and provided with "leathern sides and elastic straps which buckle over the fur" and fasten the two parts together. On the other side are fixed knobs or buttons, "so as to raise the leathern sole" and protect it "from the dirt and cold of the floor."

For women's use, "a sock of fur or similar material is attached to the heel, closing over the instep with an elastic band."

[Printed, 4d. No Drawings.]

A.D. 1865, December 23.—No. 3334.

HURN, GEORGE, and HURN, DANIEL. — "Improvements in obtaining and employing continuous lengths of tanned leather for various useful purposes," among which the patentees enumerate "boots and shoes" (but without describing the mode of application) and laces.

Continuous lengths "for weaving, plaiting, twisting, braiding, or forming into webs," are cut out of tanned skins or hides by rounding off the edges and causing a knife (set to any required gauge) "to traverse the entire surface of the skin, so as to divide it into an endless piece or coil, which is subsequently submitted to a longitudinal stretching, damping, greasing, or hammering, as may be found necessary for

"straightening or removing the angles and curves formed by the cutting." If required, the lengths are rounded by passing them through dies.

The patentees state that they "are enabled to produce from a single skin or hide a thread of leather of two thousand feet or more in length in one piece." In weaving, plaiting, &c., they use the lengths either alone or in combination with hemp, flax, silk, cotton, wool, or hair.

[Printed, 8d. Drawing.]

A.D. 1865, December 29.—No. 3371.

HALL, JOHN.—(*Provisional protection only.*)—"Improvements in the manufacture of boots and shoes." The improvements relate to the construction of soles and heels, more particularly "military or box heels and double soles."

The sole and heel are made from one and the same piece of leather, moulded "by a top and bottom tool of the desired shape of the sole and heel." The leather is steeped in water, placed on the bottom tool, and pressed upon by the upper tool. The heel and sole are thus hollowed or dished, and the hollowed parts are filled with cork or other light material; they may be attached to the upper by sewing or other means.

[Printed, 4d. No Drawings.]

1866.

A.D. 1866, January 15.—No. 132.

JOHNSON, ALBERT FRANCIS.—"Improvements in machinery for sewing." This invention relates "almost entirely to mechanism for producing a wax-thread seam for the uniting of heavy fabrics like leather, such as are used for boots or shoes, harness," &c. The chief instruments used are an awl, a hooked needle, a shuttle, a spreader, and a "take-up" which allows the thread to be "slack and subject to no unnecessary tension" whilst being passed through the fabric, and afterwards tightens the stitch.

The fabric having been placed in position on the platform, the awl descends and pierces the fabric, and feeds it along until the hole is in a position for the needle to pass through it "during the upward movement of the needle." As the awl ascends, the needle rises through the hole; a curved thread carrier twists the thread round the hook, and then the needle descends carrying the thread with it, and makes "about a third of a revolution" to bring the loop into the path of the shuttle. The spreader opens the drawn-down loop for the passage of the shuttle which passes through in a direction "contrary to that in which the material is fed along on the platform."

The awl feeds the fabric along by being fixed on the lower end of a pendulous bar which is suspended "in a recess in the awl bar," and by the aid of a spring, a moveable wedge bar "arranged in the recess of the awl bar," and a cam. The length of the stitch is regulated by a screw and a nut.

The spreader is "a wedge-formed" piece of metal fixed on the upper end of a lever whose lower end extends into a cam groove "formed in the needle carrier"; it opens the loop so as "to ensure the passage of the nose of the shuttle into it."

The take-up consists of a vibrating arm, a swivel box, and a pulley. The thread passes from a spool, partially round a guide pulley, through openings in the swivel box, partially round the pulley "arranged within the said box," and through the eye of a "curved thread carrier," the eye being "a little below the horizontal plane" of the hook when the needle is at its highest position, and partially revolving in a horizontal plane around the needle. The slackening and tightening are effected by the movements of the vibrating arm.

The presser foot is adjustable to various thicknesses of fabric, and "has to be raised preparatory to the material being fed along for the formation of each stitch":—"The foot of a leg projecting from the shank of the presser foot rests in the periphery of a cam; the upper part of the leg encompasses a screw formed on the shank and rests on a nut screwed on such screw"; another nut "screws on the screw and down upon" the said upper part; a helical spring surrounds the shank; the cam raises the foot; the spring depresses it, and the screw and nuts adjust it.

[Printed, 1s. 6d. Drawings.]

A.D. 1866, January 25.—No. 246.

PIDDINGTON, JOHN. —(*A communication from George Barnes Windle.*)—"Improvements in the manufacture of "boots and shoes." The outer sole and heel are made of wood and connected by a waist-piece of leather; the inner sole is of leather extending the whole length of the boot or shoe."

The outer sole, inner sole, and the upper are fastened together by pins or nails; the outer sole, waist, and inner sole by other pins or nails, and the waist, inner sole, and upper by other pins or nails; the heel is pinned or nailed to the upper and waist. All the pins or nails are "riveted on the inside or "at the upper ends thereof."

The outer sole may be fastened to the upper "by means of "a band of iron, the same being secured together by pins or "nails."

[Printed, *Sd.* Drawing.]

A.D. 1866, January 25.—No. 251.

MARSHALL, THOMAS, and PRETTY, HENRY COOPER,—"Improvements in finishing the soles and heels of boots and "shoes, and in apparatus employed for such purposes." The "buffing-off the grain from the under surface of the sole or "heel," the "burnishing the under sides of the soles and "heels," and "the burnishing or ironing the edges of the "soles of boots and shoes" are effected by means of revolving tools mounted in a lathe.

1. A cylindrical cutter is employed; it is of small diameter and has "parallel cutting edges from end to end," either slanting or straight. The length of the cylinder is greater "than the width of the soles or heels;" it is so mounted that one can be readily taken out and another be substituted for it. "When the [soles or parts thereof are rounding or convex, "then the buffing tool in place of being cylindrical is made "hollow from end to end."

2. The tool used is cylindrical; it is of somewhat greater length than the width of the sole or heel; it is grooved with "diagonal zig-zag grooves, the edges of which are rounded."

If parts of a sole or heel are "rounding or convex," this tool is by preference hollow from end to end. The tool is

kept clean by means of a brush worked in contact with it and pressed up "in any ordinary manner."

3. The tool is cylindrical; its periphery "may be straight, "or more or less rounded according to the shape of the edges "to be burnished." Across the periphery are zig-zag grooves with rounded edges. At one end of the cylinder are flanges "for "the purpose of creasing the sole," and a guard whose flange "enters between the upper and sole and keeps the upper "from coming in contact with the flanges," and at the same time "burnishes the upper edge of the sole." The heels are burnished by a like tool. A brush may be arranged as before-mentioned to keep the tool clean.

Provision is made for heating the hollow tools with steam.

[Printed, 1s. 2d. Drawings.]

A.D. 1866, January 26.—No. 258.

MONTCLAR, JEAN MARIE ARMAND.—"Improvements in the "manufacture of materials or compositions for decolorising "or purifying saccharine or other liquids, and for making "paint, blacking, and foundry blackening, and in apparatus "therefor." This invention relates to "the obtainment of "improved, effective, and economical substitutes for the "ordinary animal or other charcoal, whilst the materials or "compositions, or some of them, are also suitable for making "paint, blacking, or foundry blackening."

The substitutes are composed of "carbonaceous elements, "earthy elements, and in some cases phosphates." For the carbonaceous, soot of all kinds is preferred; it is in general to be mixed with "vegetable, animal, or mineral charcoal, coke, "gas, carbon, lampblack, coal, carbonised animal matters, "or other carbonaceous matter," or with "two or more of "such carbonaceous matters." Fire-clay or other clay or aluminous compound is (by preference) employed as the earthy ingredient, "but instead of more or less of it, or in "addition to it there may be employed phosphate of lime or "of magnesia, or compounds containing these phosphates." Other substances named for incorporation with the foregoing, or as substitutes for certain proportions thereof, are earthy residues obtained when distilling bog-head or other coals, *bituminous* earths or shales, from 8 to 16 per cent. of uncar-

bonised bones, bone tar, coal tar, pitch from coal tar, petroleum, dried blood, gelatine, and the carbonised flesh and bones of animals. The fire-clay should be as free as possible from iron, lime, and magnesia.

Each ingredient is separately ground to a fine powder; they are then mixed, triturated with sufficient liquid to form a paste, and ground together "to perfect the trituration and "intermixture." The liquid used is urine or water containing ammonia or gelatinous matters. The mass is afterwards dried "to retain the form imparted to it by the granulating apparatus."

The granulating "before carbonising or calcining" is considered by the patentee an important part of the invention, but he informs us that "in preparing the compositions for "paint, blacking, or foundry blackening the granulating "process prior to carbonisation is unnecessary." He describes a machine for granulating, and gives the following formulæ for making "a very good composition;" the proportions are by weight, and may be varied:—(1) 60 parts of bone flour, 25 of bone tar, coal tar, pitch, or soot, from 30 to 35 of fire-clay; (2) 20 parts of vegetable charcoal, 40 of animal charcoal, 50 of soot, 80 of clay; (3) 40 parts of vegetable charcoal, 80 of animal charcoal, 75 of clay; (4) 50 parts of soot, 80 of animal charcoal, 80 of clay; (5) 75 parts of carbonised animal body, 40 of clay.

[Printed, 8d. Drawing.]

A.D. 1866, February 2.—No. 328.

PATRICK, JAMES CHARLES. — "Improvements in cutting "presses employed in the manufacture of boots, shoes, envelopes, paper collars, and various other articles." This invention aims at obtaining "greater simplicity in the construction of cutting presses" and "considerable increase of "power therefor."

Two side frames or standards extend above a stationary bed plate which is fixed between them. Slots in the standards admit the bearings of a cutting plate which is moved up and down the slots by means of rods and cams. The rods are slotted at one end, and the bearings of the cutting plate are passed through the slots. The other ends of the rods are

attached on either side to cams, the shaft of which passes horizontally through the press. The cams "are placed outside the frame," and as they revolve (by any suitable mechanism) the cutting plate is raised and lowered. In order to set the cutting plate "to any desired elevation or depression," a coiled or other spring is placed under the bearings in the slots of the connecting rods; this with the aid of set screws enables the plate to be set to the greatest nicety.

[Printed, 4d. No Drawings.]

A.D. 1866, February 5.—No. 348.

ABEL, CHARLES DENTON.—(*A communication from Isaac Heer.*)—(*Provisional protection only.*)—"Improvements in "elastic fabrics, and in the application thereof to the manufacture of boots and shoes." The first part of this invention relates to the manufacture of the fabric. One warp of india-rubber and two or more warps of cotton, wool, silk, or other materials of any required colours are used. The india-rubber warp "is passed across the loom to the cloth beam in a "stretched condition," so that when the finished fabric is removed from the loom "the india-rubber warp will contract to "its natural length and thereby will draw together the entire "fabric, which will consequently be elastic to the extent "required, and at the same time have the same appearance "as a non-elastic fabric."

The second part consists in forming those parts of the uppers which have heretofore been made of a non-elastic fabric with gores of the above-described elastic fabric.

[Printed, 4d. No Drawings.]

A.D. 1866, February 8.—No. 397.

FELT, NATHANIEL HENRY.—(*A communication from John Gillingham Felt.*)—"Improvements in the manufacture of "stiffenings for the heels of boots and shoes." These stiffenings are made from "a composition of india-rubber, sulphur, "and ground rags or fibres." The proportions preferred are one part by weight of the sulphur compound of india-rubber and two of ground fibres. The ingredients are intimately mixed, put into metal moulds, and kept therein "till the "process of converting the sulphur compound by heat has

"been completed." The bottom and curved back of a stiffening are moulded in one piece; or the compounds may be rolled into sheets, the parts may be cut out, and be put into moulds and subjected to heat.

Sometimes the interior of a stiffening is lined, or the outside is coated with woven fabric; the fabric is put into the mould with the compound and becomes united therewith by the heat used in producing the change.

[Printed, 8d. Drawing.]

A.D. 1866, March 1.—No. 623.

ANDREWS, ALFRED CHRISTMAS.—"Improvements in screw rivets for boot pegs and screw nails for various purposes, and in machinery for the manufacture of screw rivets and screw nails, a part of which improvements in machinery may also be applied to other purposes." These rivets are made with a head, a conical point, and "a continuous helical or screw thread" on the stem.

The machinery employed for making the rivets is of the following description:—On the bed of the machine is mounted "a travelling headstock" which receives "a reciprocating sliding motion" from a connecting rod and an eccentric worked by the main shaft. The headstock is hollow and carries at its front end a holder wherein are fixed the dies for screwing the wire as it is fed into the machine. The holder is capable of rotation in one direction only; it is provided with antifriction rollers "which bear against the end" of the headstock. The screwing dies and the headstock "constitute the feeder of the machine." At the opposite end of the machine a fixed headstock carries "a rotating pointing tool" which receives "a reciprocating motion" through a bell-crank lever actuated by a cam on the main shaft. Between the travelling headstock and the pointing tool are "gripping dies" by which the wire is held while being screwed; the opening and closing of these dies are effected by a cam on the main shaft. Near the grippers is a circular saw to which motion is given by a train of wheels on the main shaft; the saw rises and falls, "so as to cut off the required lengths of wire at the proper times," by means of a cam on the main shaft.

The action of the machine is described in the Specification. The lengths cut off by the saw fall into a receptacle below. The screws "may be headed in the ordinary way."

[Printed, 1s. 2d. Drawings.]

A.D. 1866, March 12.—No. 746.

LINFORD, CHARLES. — (*Provisional protection only.*) — "An improved apparatus for paring, burnishing, polishing, "or otherwise finishing articles manufactured of leather." A cylinder or drum of wood, metal, or other material, is made to rotate rapidly; in some cases a block or board has a rapidly reciprocating motion given to it. On the periphery of the cylinder or on the surface of the block are fixed "sharp "knives, files, burnishers, or such other articles as the "nature of the work to be done may require." An adjustable guide regulates the depth to which the knives, &c. are to cut.

For finishing or scraping the bottoms of boots and shoes and for levelling the heads of rivets or brads on the soles and heels, the cylinder or block "might be simply a grindstone, "the shape of which would vary according to the nature of "the work and according as a reciprocating or rotary motion" was given to it.

[Printed, 4d. No Drawings.]

A.D. 1866, March 15.—No. 777.

COLE, JAMES, junior. — "Improvements in the manufacture "of elastic gusset webs." The india-rubber or elastic warps are arranged as heretofore to be worked into the fabric "as "dead or stationary warp for a time," but at those parts where the woven webs are divided into gusset pieces and where the sewing takes place when affixing the gussets into boots, shoes, or other articles, the said warps "are by the "harness of the loom caused to form parts of the sheds "open for the passage of the shuttle or shuttles and are thus "tied or woven into and form parts of the woven fabrics." By the employment of jacquard or like apparatus the parts where the elastic and inelastic warp are caused to interweave with the weft or wefts "may be formed in lines diagonally "across the elastic web, or in curved or other lines across

“ the elastic web, and in such parts of the fabrics the ends
“ of the elastic or india-rubber warps will be held securely
“ and will not be liable to slip as heretofore.”

A jacquard machine is added to an ordinary loom for weaving elastic gusset webs, and each of the india-rubber warp threads is passed through an eye of the jacquard harness. The cards are so cut that each india-rubber warp thread works for a time as a dead warp, and then the machine causes it “ to become active and interweave itself with the weft.” Thus there is produced on the sheet of fabric a sort of pattern “ consisting of patches or broad bands and lines, either straight
“ or otherwise, dividing the patches or bands the one from
“ the other.” Each patch is made “ the proper size and
“ shape for a gusset.” Each division line is wide enough
“ for two selvages,” and in it “ the jacquard causes the india-
“ rubber warp to interweave itself with the weft in such
“ manner that if the inelastic warps were removed, there
“ would still remain in these lines a complete tabby fabric
“ produced by the weft passing alternately over and under
“ the india-rubber warp threads in each traverse from side
“ to side of the fabric.”

[Printed, 4d. No Drawings.]

A.D. 1866, April 6.—No. 986.

COLE, WILLIAM.—“Improvements in the manufacture of
“ elastic fabrics.” These fabrics are intended to be used as
gussets, and the improvement consists in making them “ with
“ a raised rib or pattern on the surface.” This rib receives
“ the chafing wear” to which the gusset is subjected, “ more
“ especially when it is applied to boots and shoes,” and
so “ protects the general substance or foundation of the
“ fabric.”

If the fabric is to be ribbed, the ribs are formed “ in sufficiently
“ close proximity to protect the foundation ;” if it is to be
“ of scroll or other pattern,” the raised and sunk parts are
“ generally and equally interspersed,” and in no case is there
left “ any considerable area of the plain or sunk surface
“ in one spot.”

The ribs and patterns are produced “ in the ordinary
“ manner of producing patterns in woven fabrics,” and a
jacquard apparatus may be applied to “ vary the pattern.”

Instead of forming continuous ribs, the additional warp threads introduced "may be carried through to the back of the fabric at short intervals, which will produce a series of isolated raised spots on the surface;" this pattern "answers the purpose of protection extremely well."

[Printed, 4d. No Drawings.]

A.D. 1866, April 18.—No. 1095.

EDWARDS, WILLIAM YOUNG. — (*A communication from Charles Howard Crosby.*)—(*Provisional protection only.*)—"Improvements in eyeletting machines." In this machine "the hole is pierced and the eyelet fixed in the work at one operation."

A piercing instrument is carried in the end of a rod; it slides therein, but is pressed outwards by a spring when not otherwise acted upon. The upper end of the rod forms one part of the "clinchng apparatus," the other part "being fixed to an arm or projection from the framing, with capability of adjustment therein." Motion is given to the piercing instrument by a treadle or by otherwise acting upon the rod. The eyelets are placed in a hopper of a cylindrical form, "to which rotary motion is given in the motion of the piercing instrument by means of a ratchet wheel acted upon by a driver connected with the rod." As the hopper revolves, the eyelets are caused to move towards the periphery thereof and descend through a shoot into position to be taken by the end of the piercing instrument in the commencement of its motion. The rod is then caused by means of a cam to move forward so as to withdraw an eyelet from the shoot and then in its further forward motion to come into position opposite the fixed part of the clinching apparatus. The piercing instrument will then move towards the fixed part to pierce a hole in the work, and in the further motion of the rod it will be forced within the rod, and the eyelet will be fixed in the work by the end of the rod coming towards the fixed part and clinching the eyelet between them. The lower part of the shoot is provided with a spring stop to prevent the eyelets from falling out. The hopper is made with ribs for agitating the eyelets as it revolves, and bushes are fixed to the ribs for "more effectually ensuring the eyelets standing in a

“ proper position to descend by the shoot.” The arrangement of the hopper admits of modifications which the inventor describes.

The machine may be made with more than one set of clinching apparatus.

[Printed, 4d. No Drawings.]

A.D. 1866, April 20.—No. 1117.

HUGHES, EDWARD THOMAS. — (*A communication from Antoine Guérin.*) — (*Provisional protection only.*) — “Improvements in the manufacture of boots and shoes,” which have “elastic webs at the sides.” The uppers are cut without seam before and behind; the seam is “below each elastic at the bend of the boot or shoe. This method of cutting enables the workman “to bend or shape the material for the “front part” as well as “the leather or material for the back “part of the upper.”

Sometimes the upper is made in one piece “with one seam “only at the back,” and if required “an ornamental strengthening piece” is attached at the back.

[Printed, 4d. No Drawings.]

A.D. 1866, May 4.—No. 1275.

JOHNSON, JOHN HENRY. — (*A communication from William Henry Shurtleff and Charles Henry Church.*) — “Improvements in apparatus for lacing boots and shoes, gaiters, and “other articles of dress, and in the mode of attaching the “same.” The inventors call their contrivance for attachment “a button hook,” as it “combines the appearance of a rounded “button or stud with the properties of a hook or staple.”

The top portion is a button or cap “struck up in dies to “assume a concave convex form,” the convex side being on the outside. With the cap is united a shank, consisting of a strip of metal “bent under the cap and then turned back in “the opposite direction so as to form a hook or staple;” the interior of the hook is rounded off so as not to injure the lace which is hooked on to it. That part of the bent shank which rests on the surface of the upper leather is disc-shaped and either slightly rounded or flat. The under side of the disc carries two or more prongs which pass through the upper and are clinched on the opposite side.

These button hooks are usually "made in one piece from a single blank and may be struck off at two or more successive blows in suitable dies;" they are fastened on in two parallel rows, and the lace passes "externally zig-zag fashion from hook to hook."

[Printed, 8d. Drawing.]

A.D. 1866, May 7.—No. 1295.

DE TIVOLI, VITAL. — (*A communication from Major-General Angelini.*)—(*Provisional protection not allowed.*)—"A new system of application of pads of india-rubber or "other elastic materials." These pads are made in the form "of one or more tubes, or of thick sponge, or of any other "form," and are shaped to the parts of the body to which they are to be applied, or to the article of dress into which they are to be put. The pads may be applied to a variety of articles, amongst which are mentioned leggings, and the soles of the foot, socks, or shoes.

[Printed, 4d. No Drawings.]

A.D. 1866, May 28.—No. 1480.

LOCK, CHARLES. — (*Provisional protection only.*)—"Improved method of attaching soles and heels to boots, shoes, "and other similar articles." The heels are made of a circular form and in two separate parts. The upper part is fixed, and a metal plate is screwed to it. The plate is made with "any "convenient number of circular hollow projections, the insides "of which are formed with female screws." The lower part is pierced with holes for the insertion of the projections, and screws pass from the bottom of the lower part into the projections.

Or a piece may be cut out from the middle of the plate having teeth on its periphery; the cut-out piece is fastened to the lower part of the heel; the teeth fit into each other, and the parts are screwed together.

Clumps and other soles are fastened on by fixing to the inner sole a plate having radial arms, which (as well as the plate) carry projections similar to the foregoing; by piercing in the clump or other sole holes for the admission of the projections, and by screwing the whole together as before described.

[Printed, 4d. No Drawings.]

A.D. 1866, May 29.—No. 1502.

WADSWORTH, JAMES.—(*Provisional protection only.*)—"Improved methods of rendering the soles or bottoms and heels of boots and shoes more durable." To any part "which is likely to wear away the quickest" the inventor fixes "a number of metal plates by means of one or more nails or pins having conical heads." The plates have "conical holes with projections or burrs in contact with the leather"; the projections retain the plates on the leather until the plates are worn away. The plates (which can be corrugated on one or both sides) are placed on the soles at any suitable distance from each other "to allow the sole to yield to the spring of the foot."

For heels the inventor uses "cast or stamped metal shells"; each has a circular recess into which is cemented a circular piece of leather, india-rubber, or other substance, "so that when one part is worn away, it can be turned to another position when the cement is softened by heat." The piece may be strengthened with nails or plates previous to its introduction into the shell; or it may be enclosed in a metallic ring which is cemented into the shell. The shells may be made of the shape of ordinary heels and have leather, &c. cemented into them.

Sometimes the inventor fixes to the boot or shoe a shell of circular shape or of the shape of the ordinary heel, and places in the shell "a block or ring of india-rubber having a hole in the centre." Into the hole he puts "a boss or ring having at the bottom a plate" which forms the "wearing part of the heel." The block is held fast by cement or its own elasticity, and the plate by cement or "the elasticity of the india-rubber encircling the boss."

[Printed, 4d. No Drawings.]

A.D. 1866, July 2.—No. 1762.

COOK, THOMAS.—(*Provisional protection only.*)—"Improved machinery for uniting together materials employed in the manufacture of boots and shoes, saddlery, driving bands, and such like articles as require to be strongly united together." A "peculiar feature and novelty of this invention" consists in employing a long piece of wire,

"leading the same downwards, and forcing the same into "and through the entire thickness of the materials." The wire is afterwards cut by an instrument so formed as to cut it "to a point or wedge shape."

Construction of the machinery employed:—A short axle is mounted at the upper part of the framing; one end carries a cam, the other a small fly wheel "connected to treadles." In connection with the cam is a bell-crank lever whose lower end is formed "with a wedge-shaped foot for operating upon a pair of cutting shears "employed to cut the wire after "it has been forced into the material." The wire is gripped and forced into the materials by "a pair of hinged sliding "nippers operated upon by a wedge attached to the horizontal "arm" of the lever. The piece of metal upon which the nippers slide "is connected by a rod to a slot in a bent lever, "the lower end of the said lever being mounted on a stud "or fulcrum fixed to the framing." The upper end of a bent piece of metal "somewhat similar to the letter L" supports the materials; and the horizontal part of this piece "is formed with a vertical axis working in a suitable bearing "and capable of being raised or lowered."

[Printed, 4d. No Drawings.]

A.D. 1866, July 11.—No. 1821.

NEWTON, ALFRED VINCENT. — (*A communication from John P. Jamison.*) — "Improved machinery for crimping "leather for boot fronts." The former over which the leather is to be stretched is "a vertical metal plate;" it is secured to the table of the machine and central to a frame which carries the working mechanism; its upper edge is curved and wedge-shaped. "The frame consists of two standards united at top by a cross-head. The standards are fitted with vertical guides for the reception of the slotted ends of a sliding cross-head. Pendent from the sliding cross-head "but free to "turn as on a fulcrum" are "two pairs of springs;" each carries "a wing-shaped presser having a rounded lower edge." The pressers are independent of each other and "virtually "self-adjusting to suit various thicknesses of leather." At the back of each presser is fitted an india-rubber block; these blocks are held in position by rigid arms pendent from the sliding cross-head, and by their means "a tendency is

“ given to the pairs of pressers to remain in contact with “ each other.” The cross-head is moved by means of a vertical rack fitted to it; the rack is actuated by a pinion and the usual gearing which terminates in a handle.

The pressers are carried down over the former, and being thereby opened they will move over the leather and stretch it. As, however, the leather must be stretched “endwise “ as well as crosswise,” the pressers are fitted at the back with bowls which come into contact with “angular guides “ bolted to the former.” The guides “will cause the pairs “ of pressers to move laterally or recede from each other “ and thus to draw out all the wrinkles from the leather “ that the downward movement of the pressers may have “ formed.”

[Printed, 10d. Drawing.]

A.D. 1866, July 30.—No. 1964.

GREENWOOD, THOMAS and KEATS, WILLIAM. — “Im-
“provements in machinery and apparatus for the manufacture
“of boots & shoes and other coverings for the feet.” The first
part of this invention relates to a mode of transmitting motion
from the main shaft to the various working parts, the object
being to transmit the motion “in such a manner as will admit
“of arresting the movement of the working parts instant-
“aneously without stopping the rotation of the main shaft:”—
An “intermediate shaft” is employed; it is mounted in a
forked arm or framing “which is capable of rocking in its
“bearings on the stationary framing of the sewing machine.”
On the inner end of this shaft is a pulley, the periphery of
which is covered with some “suitable substance for the pur-
“pose of causing adhesion to the internal flange” of a pulley
mounted on or geared to the main shaft of the machine.
The covered pulley is brought into contact with the internal
flange of the other by depressing a treadle.

The second part consists in the employment of “a hollow
“or standard,” by aid of which “the thread is supplied to
“and lapped round” the hook of the needle:—The post is fixed
on the table of the machine under the needle. A vertical shaft,
passing up the inside of the post receives “a partial rotary
horizontal or axial motion” from a horizontal rack. A pinion
on the upper end of the shaft “drives another pinion through

"a side hole in which passes the thread." The hook descends through a hole "made near the edge of a metal plate" (which forms a cap or cover at the upper end of the post) and enters a "hole made in the centre of the thread pinion." As the hook descends into the hole of the pinion, the pinion makes "a partial rotation" and lays the thread into the hook, "which will then draw it up and operate with it in the usual manner to make the stitch." The cap requires "to be modified in shape according to the particular kind of work or the seam which it is required to sew."

The last part relates to a new construction of last:—When the last is cut into shape, "a wedge-shaped piece slightly curved" is cut out of it, and the instep part is hinged to the other part at a point "just behind the insertion of the toes." The last is inserted readily by withdrawing the wedge-shaped piece.

In the Provisional Specification the patentees describe (but do not claim) "a mechanical arrangement for skirving the welts and channelling the soles of boots and shoes."

[Printed, 1s. 6d. Drawings.]

A.D. 1866, August 2.—No 1995.

JOHNSON, JOHN HENRY.—(*A communication from David Henry Barber and George Mellen Wells.*)—"A new or improved implement for the use of boot and shoe makers." Pincers, hammer, knife, and awl, are combined in this tool. It is made in the ordinary form of shoemakers pincers with a hammer projecting from the lower jaw. The upper jaw carries an awl near or at its outer end and above this a knife, which may be arranged either "permanently to project" or "to sink by the action of a spring into a groove made for its reception." The knife may be removable, in which case it is preferred to secure it "by pins or by inserting it into a slot made in the upper jaw;" it is unsheathed "by simply depressing the tail of the lever" which forms or is attached to its inner end.

[Printed, 6d. Drawing]

A.D. 1866, August 15.—No. 2100.

SHAW, WILLIAM, and CONNELL, JAMES.—"Improvements in the manufacture of elastic and other fabrics." One part

of this invention relates to the manufacture of elastic fabric "for boot-gussets and other purposes." The "main feature" of the invention consists in producing a pattern or figure on the fabric without the use of additional threads.

1. The patentees employ "two sets of warp threads in addition to the binder or tie warp and the india-rubber;" the two sets are of different colours, usually one set white, the other coloured. They obtain a figure in the course of weaving "by taking the white warp threads from the bottom and making them for a time to weave with the weft at the top and form part of the top fabric, whilst at the same time the coloured threads go down and in the same way form part of the bottom fabric." In order that the tie warp may not disfigure the pattern, they "make the threads composing it alternately white and coloured, or to correspond with the two sets of fabric warps."

2. They employ "two shuttles carrying wefts of different colours;" each shuttle passes under some of the india-rubber and over the remainder;" where the first shuttle passes underneath the india-rubber, the second passes over it, and vice versa, and so the figure is produced."

They describe in their Specification the manner in which they prefer to arrange the loom and to weave each fabric.

[Printed, 4d. No Drawings.]

A.D. 1866, August 27.—No. 2200.

LAMB, EPHRAIM. — (*Provisional protection only.*)—"Improvements in the construction of apparatus for cleaning and polishing boots and shoes, such apparatus being also applicable to other purposes." This invention admits of several modifications.

In one, wheels (one or more) are mounted in bearings attached to a stand and caused to revolve "by any of the well-known methods." Brushes are attached "to the sides of the periphery" of the wheels; they are readily removable so that others of any desired degree of hardness may be substituted. Or the wheels "may be replaced by others of a different character." The boot or shoe (either on or off the leg or foot) is pressed against the brushes. When two wheels are used, "they may be placed parallel" to each other, so that

the boot or shoe can be introduced between them. An additional wheel with brushes on the face or sides may be provided for "cleaning or polishing the toes and front portions and "heels." An endless band carrying brushes may be used for the heels. The foot or the boot or shoe is supported on "rests "or bars or any suitable contrivances" moveable and adjustable. To keep the front and back portions of the boot or shoe "in a sufficient state of tension" blocks "similar to "portions of a last" are attached to a system of the levers known as lazy-tongs.

In another, (a portable apparatus) levers "such as those "before described" have a rotary brush attached to one end and a pulley and winch to the other, "the brush and pulley "being connected by an endless band."

In another an endless band carrying brushes on its surface passes over a roller placed at each end of the apparatus, and "parallel with one of the rollers is placed another roller "furnished with a winch and so arranged that it shall press "upon the endless band."

Another "consists of a straight rod or bar" having at one end and at right angles thereto a rod or bar whereon circular brushes (one or more) "are mounted in suitable bearings "placed upon the transverse bar;" at the other end is a wheel or pulley provided with a winch and connected with the brushes by an endless band. This apparatus may be rendered more portable by jointing the transverse bar or by making it of tubes which slide one within the other.

[Printed, 4d. No Drawings.]

A.D. 1866, September 3.—No. 2260.

LAMB, EPHRAIM, and MIDDLETON, SAMUEL.—(*Provisional protection only.*)—"Improvements in fixing the soles and "heels of boots and shoes." The boot or shoe having been lasted, an additional or mid-sole is formed having on the side "next the insole transverse or longitudinal channels." The outer sole "is provided on the outer surface thereof" with corresponding channels. The mid-sole and the outer sole "are connected by means of endless straps or bands of india "rubber, or other suitable elastic or non-elastic material" placed in the channels. "The combination thus produced "is attached to the boot or shoe by riveting or otherwise,

“securing the mid-sole to the insole.” Straight bands may be used; they are placed in the channels in the outer sole, “and the ends turned over into the corresponding channels or grooves in the mid-sole” and secured by studs or other means.

“Various modifications may be adopted,” the principle being preserved that the soles and heels “can be readily connected with or detached from each other,” and portions of the band “be shifted in the channels” when worn thin.

Heels may be attached “by means similar or analogous” to the foregoing. Or they may be made circular and be attached to the stiffeners by pivots or screws, so as to be capable of being turned thereon. Heels of other shape may be readily fixed and removed “by attaching to the stiffener a dovetailed block,” and constructing the heel with a corresponding recess so that it can be slipped into position.

[Printed, 4d. No Drawings.]

A.D. 1866, September 5.—No. 2284.

VAUGHAN, REGINALD SAMUEL MORDAUNT.—(*Provisional protection only.*)—“Improved apparatus for cleaning and polishing boots, shoes, and knives.” A circular disc is attached eccentrically to the lower end of a vertical shaft; it is placed “in the interior of a rectangular box.” This box is supported by means of framing, “in which are placed slides or other analogous contrivances” whereon the box can work. When the shaft is caused to rotate, the disc will revolve, and the box will be “moved thereby alternately backwards and forwards with any desired degree of rapidity.”

For cleaning and polishing boots and shoes brushes are attached “to the lower surface” of the box. The brushes are readily removable, so that others of a different character may be substituted. The boots or shoes (with lasts therein) are “supported on rests, bars, or sockets,” adjustable in height and position.

[Printed, 4d. No Drawings.]

A.D. 1866, September 8.—No. 2310.

ALLBON, CHARLES FREDERICK.—(*Provisional protection only.*)—“An improvement in boots and shoes.” In order to render soles more flexible and easy to the feet, the inventor

inserts between each piece of leather composing the sole a piece or pieces of textile fabrics, "stitching or riveting the same together."

[Printed, 4d. No Drawings.]

A.D. 1866, September 8.—No. 2316.

CLARK, WILLIAM.—(*A communication from George Valentine Sheffield and James Fitch Coburn.*)—"Improvements in leather and in machines for manufacturing the same." The leather, "especially applicable to soles of boots and shoes," is rendered more durable by the insertion of wire pins. The machine and its action are very fully described in the Specification. The leather is placed upon a platform over a feed wheel; the wire is fed between rollers; a slide carrying a piercing tool and hammer descends, causing the one to pierce the leather and the other to force the wire into the hole; a chisel or knife then cuts off the wire, leaving it in position "for the hammer to act upon and force it into the leather."

The framing consists of a bed, two uprights, and an arched cross beam. The driving shaft has one bearing in one of the uprights, the other in a hanger secured to the under side of the beam at about its middle; it carries a driving pulley at one end outside the upright, a cam between the pulley and the upright, and a cam at its inner end.

The platform is secured between the uprights.

The feed wheel is carried by an adjustable horizontal shaft under the platform; its periphery "is roughened and projects slightly above and through the central opening in the platform."

The feed rollers are hung within a bar (placed just above the platform and parallel with it), "so as to move toward or away from each other"; they are grooved "and are held so as to tightly bind the wire which passes in and between them by means of rollers or wheels," one to each upon its outside edge.

The slide moves between uprights "upon the upper side of the horizontal bar"; it is hung upon a lever bar extending towards the upright under the driving shaft and turning on a fulcrum on the upright. The piercing tool and the hammer are in the lower end of the slide, "the latter to the rear of the former, but in the same line therewith"; both move through

apertures made in a block secured to the under side of the horizontal bar.

The chisel or knife is "secured in the inner end of a horizontal slide arranged in the under side" of the horizontal bar; the outer end of the slide is connected to the arm of a shaft "turning at each end in bearings of the projecting pieces upon the rear side of the horizontal bar," and the shaft "has a long projecting arm extending upward toward the cam on the end of the driving shaft."

[Printed, 8d. Drawing.]

A.D. 1866, September 10.—No. 2321.

DE GAUDEL, CHARLES FRANCK. — (*Provisional protection only.*)—"Making boot legs of one piece." This is effected "by a very simple modification in the dimensions of the jacking block." The leg of the block is made sufficiently wide to "permit the spreading, drawing, and working upon it of a piece of leather sufficiently large that its development after paring may represent the total circumference of the leg of the boot, the front or foot included." The leather is joined by a single seam which is placed by preference at the back. The bending, &c. may be done "mechanically" on one or other of the machines already invented for such purpose by modifying the dimensions thereof.

[Printed, 4d. No Drawings.]

A.D. 1866, September 17.—No. 2383.

WALL, EDWARD.—"An improved elastic waist for boots, shoes, slippers, clogs, and sandals." This waist "gives freedom and comfort to the gait of the wearer;" it is made of vulcanized india-rubber covered or not with leather. The waist is formed of the required shape and size "by melting into a mould or by cutting or by both these means;" it is fixed to the heel and fore part of the boot or other article by sewing or riveting.

[Printed, 4d. No Drawings.]

A.D. 1866, September 21.—No. 2429.

CHALLINOR, THOMAS. — (*Provisional protection only.*)—"Improvements in machinery or apparatus for cleaning and

"polishing boots and shoes, harness, and other manufactured leather goods." Circular brushes are mounted on a spindle which revolves by means of a treadle or other contrivance. The blacking is contained in a reservoir and is applied to one of the brushes by a feeding brush, "which is carried by parallel levers and is capable of being depressed" so as to take-up the requisite quantity of blacking and "of being then elevated by spiral or other springs." When the feeding brush is charged, it is brought into contact with the blacking brush "by turning-over partly the parallel levers, which on being released return to their original position" and carry the feeding brush out of the way. "Other brushes or rubbers" may be added if desired.

[Printed, 4d. No Drawings.]

A.D. 1866, September 25.—No. 2475.

THURGAR, AUGUSTUS HENRY. — "Improvements in the manufacture of over-shoes," intended to protect the feet from cold when travelling, &c. A sole of leather (or of leather combined with gutta percha or cork) extends from the toe to the projection or front of the heel piece, "coming into position under the bridge or arch of the boot against the front of the heel piece." The upper surface of the sole has fastened to it a layer of cork "for the purpose of serving as a non-conductor;" the under surface has secured to it three or more discs of horn, hard wood, or other material, "for the purpose of avoiding contact with the damp or cold." To the upper edges of the sole pieces of enamelled or other leather or other substance are sewn or nailed; these terminate in tabs "over the bend of the foot or the fore part of the overshoe," and between the tabs a piece of elastic is attached "forming a cross band." Within the side pieces and band (and fixed to the upper part of the sole) is a sock of skin, fur, or wool, "open at each end so that the wearer may insert the boot into the overshoe, the toe being left partially open in order that the point of the wearer's boot may not be stopped until perfectly fitted to the inner lining."

Ladies' overshoes may be ornamented with buckles or coloured trimmings.

[Printed, 4d. No Drawings.]

A.D. 1866, October 8.—No. 2585.

HASELTINE, GEORGE.—(*A communication from Matthew Henry Merriam and Eugene Lindsey Norton.*)—"Improvements in the manufacture of leather binding," employed mostly for binding the edges of shoes. This binding is made up of such short pieces "as can be cut from skins by scarfing" and cementing" the ends together. The pieces are reduced after the joining to a uniform width and thickness, and are then passed into a winding machine, "which by preference is" such as will measure the same into definite lengths while "making up the binding into scroll-like rolls like rolls of" tape."

The pieces when joined are set out on boards, and when dried are cut into strips of about two inches wide. These strips are afterwards cut by rotary shears into narrower ones, "a slight string or shaving being taken off from the outer edge of each outer strip to secure straightness and uniformity of width."

The cement preferred is "isinglass or other fine glue."

Binding for other purposes may be coloured and stamped or embossed.

[Printed, 4d. No Drawings.]

A.D. 1866, October 9.—No. 2600.

GEDGE, WILLIAM EDWARD.—(*A communication from Camille Mouchonay Strand.*)—(*Provisional protection only.*)—"Improvements in the cutting out of boots, shoes, "and gaiters of all kinds." Instead of using paper or paste-board patterns the inventor prints on the leather or other substance "not only the outline of the piece but also the lines "serving for the make, such as the lines of punch holes;" the printing is done "by means of blocks in relief" constructed in the following manner:—

On a wooden block formed of several pieces (to prevent warping) glued together are traced the shape to be reproduced and all the lines which may be of use in the making; then "following the contour of these lines small blades of copper "are sunk in the wood" forming a relief on the surface. Thus "a veritable printing block" is obtained from which the pattern is transferred to the material by the aid of a coloured

composition. For leather goods "actual cutting and punching "out tools" are used if required; they may be worked by pressure or percussion. "The points of the punch holes "are formed by equidistant copper wires sunk in and set up "at the same time as the outline." Ornamental designs may be traced within the pattern.

[Printed, 6d. Drawing.]

A.D. 1866, October 15.—No. 2660.

GILES, JOHN.—"Improvements in the manufacture of certain "descriptions of nails, tacks, and pins." The patentee includes in his invention the manufacture of "hob or shoe "nails." These, as well as certain other descriptions of nails, he casts in moulds "consisting of one iron mould to form the "heads and one sand mould for the shanks."

By this means he saves "the labour of preparing for every "casting a fresh mould for the heads, as one iron mould will "work for years," and he moreover obtains "a chill cast head "for iron nails and a much better finish."

[Printed, 4d. No Drawings.]

A.D. 1866, October 30.—No. 2800.

CHURCHMAN, HENRY, and BRABY, FREDERICK.—(*Provisional protection only.*)—"Improvements in machinery or "apparatus for cleaning boots and shoes, also applicable to "the cleaning of other articles." This invention admits of different arrangements.

In one, six discs are mounted on a revolving horizontal spindle, each two having "a concave brush surface formed "between them." The two discs are capable of being adjusted as to distance from each other by means of springs or springs "in combination with a set of screw spindles." Each brush surface is divided into two parts, or the bristles are fixed on a flexible back capable of expanding or contracting. The blacking is supplied "from a trough or revolving perforated cylinder "arranged above the brush."

The boot or shoe is placed upon a slide "which is pushed "under, over, or against the revolving wheel brushes."

In another, each pair of discs forms a separate machine. The brushes "may be arranged end on end, so that the hollow

“ of one brush is opposite the hollow of the next.” The discs may be “ fixed rigidly together.” Bristles may be “ fixed on the edges of the discs.” The brush surfaces may be “ cylindrical or even convex.”

In another, only one wheel brush of large diameter is employed ; it has “ three different brush surfaces upon it.”

In another, “ two separate revolving discs are arranged opposite each other ;” each has bristles “ fixed upon the opposite flat faces, and if requisite also upon the circumference.” A narrow cylindrical brush is placed between the discs, “ but somewhat above them ;” this brush cleans the top of the boot or shoe.

In another, the two discs carry on their circumference bristles which serve as a dirt brush and on their opposite faces “ an annular brush surface ” for polishing and “ a central brush surface ” for applying the blacking. Or one disc alone may be used, having bristles on its circumference and both sides.

In either arrangement there may be “ a plate with an edge for scraping off the dirt from the sole of the boot or shoe, such plate having a curvature at the end for clearing out the hollow between the sole and upper.”

“ The revolving brushes may be mounted and driven in various ways.”

[Printed, 4d. No Drawings.]

A.D. 1866, October 30.—No. 2811.

DAGGETT, LYMAN.—“ Improvements in boots and shoes.” The first part of this invention relates to the construction of an inner or false sole ; it is composed of sheet india-rubber and a lining or covering of leather or cloth. The sole is punctured with numerous holes ; the lower surface is made with projections, and the holes pass through the spaces between the projections. The sole is supported on the insole by the projections, and air circulates underneath it and up through the holes.

The second part relates to “ an insulator ” and its arrangement ; it consists of “ a sheet of vulcanized india-rubber and a series of conic or tapering frusta ” projecting upward from the sheet and arranged at “ about equal distances apart lengthwise as well as across it.” The flat surface rests on

the outer sole, and the insole (pierced with numerous holes) "rests in the india-rubber projections and is supported by them." The holes "allow air to circulate" through the insole and "the spaces about the projections."

[Printed, 6d. Drawing.]

A.D. 1866, November 9.—No. 2916.

NORTON, CHARLES DOUGLAS.—"A new and improved method of making revolving boot and shoe heels," so that when one portion of the heel is worn down, the heel may be readily turned and another portion be brought into wear.

A metal disc, pierced with a central screw hole and near the edge with holes for the reception of metal points and with other holes for the passage of screws, is screwed to that part of the heel "which is in a line with the waist." The other part of the heel is circular; it contains a washer for the shoulder of a central screw, is bored for the passage of this screw, and has metal points driven or screwed into its upper surface. When the central screw is driven home and countersunk in the lower part of the heel, the metal points enter the corresponding holes in the disc, and "the revolving part of the heel is held as firm as if it was nailed on."

"The apparatus may be reversed," the screw passing from the inner sole into the disc on the circular part; the points "may be on either part of the heel," and a sock is introduced "to prevent irritation from the metal in the inside of the boot."

[Printed, 6d. Drawing.]

A.D. 1866, November 16.—No. 3008.

VERO, JAMES.—(*Provisional protection only.*)—"Improvements in the manufacture of boots and shoes." The inventor makes the soles of boots and shoes waterproof by introducing wood into the construction of the insoles. The wood preferred is American birch cut to about the thickness of one sixteenth of an inch; to this he glues leather or textile fabric on one or both sides; or he cements two boards together with india-rubber cement. Insoles are cut or stamped out from the prepared boards, and the boot or shoe is completed in the usual manner.

To prevent pegs, &c. from injuring the feet he proposes to introduce socks made of thin rolled steel or other metal and covered (or not) with paper, leather, cork, or felt.

[Printed, 4d. No Drawings.]

A.D. 1866, November 26.—No. 3114.

CLARK, WILLIAM.—(*A communication from Jean François Piedallu.*)—"Improvements in the manufacture or preparation of leather and other materials." The inventor renders leather, boots and shoes, and harness waterproof by the application thereto of either of the following compositions:—

(1) Yellow or white wax 2 parts, mutton suet or oil of the same 1 part, neats foot oil 1 part, and benzine, or tar schist, or petroleum oil 1 part.

(2) Burgundy pitch, colophony, or resin 1 part, white or yellow wax 1 part, mutton suet or beef fat 2 parts, siccative animal oil 1 part, and benzine, coal schist, or light petroleum oil 6 parts.

The ingredients are made into a paste; the article to be treated is dried at a temperature of from 80° to 90° Fahr.; it is then coated by brushing it over with the paste melted into a solution or by dipping it into the solution; it is then heated to cause the solution to penetrate the pores; and the processes are repeated "until the leather is completely soaked." When the leather is dried, it "remains supple and is not liable to crack," and "is impervious to water."

[Printed, 4d. No Drawings.]

A.D. 1866, November 29.—No. 3137.

WADSWORTH, JAMES.—"Improved methods of rendering the soles and heels of boots, shoes, and clogs more durable, and for improved modes of constructing the articles to be used for that purpose, and also for improved methods of fastening moveable heels of boots and shoes." The first improvement consists in attaching to those parts of soles or heels which are "likely to wear away the quickest" small flat or corrugated metal plates. These plates are pierced with one or more conical holes made with "a burr or projection around the hole on one side;" they are fastened on with nails having conical heads, the burrs being "in contact with the leather;" they are placed at such distance apart as "to allow the sole to yield to the spring of the foot." Nails are

not required for gutta percha soles or heels; the plates are pressed on hot, and are held firmly by the burrs when the gutta percha is cold.

The second consists in the employment of "new or old wire cards" for the wearing parts of soles and heels. The spaces between the teeth of the cards are filled with gutta percha or other suitable material, and the "solidified card" is used "instead of leather and nails or other materials for the soles and heels."

The third relates to improvements on the inventions for which Letters Patent were granted to Messrs. James and Joseph Wadsworth, dated March 13th, 1862, No. 687, and January 14th, 1864, No. 102. The moveable discs are made with "a circular recess;" they thus "form outside shells for the wearing part of the heel," which is cemented into the shells instead of being fastened on with screws. The wearing part may be of "solidified wire card, leather and nails, blocks of india-rubber or gutta percha." The moveable parts of the heels are fastened "by means of gutta percha, elastic glue, or other cement" and "can be turned to any position when the fastening material is softened by heat." Similar discs may be fixed to the boot or shoe with screws or nails "without the foundation or fixed plates described in the Specifications." The discs may be circular or of "the shape of the ordinary heel."

[Printed, 4d. No Drawings.]

A.D. 1866, December 8.—No. 3237.

HASELTINE, GEORGE.—(*A communication from Reuben Whitehouse Drew.*)—"An improved machine for pegging boots and shoes." This machine is worked by hand; the awl and peg-driver secured to the plunger have not any movement independently of each other; the machine is fed along the sole by aid of a crank attached to the driving shaft, "the end of which is flattened or eccentric so as to cause the vibration of one frame upon another;" the pegs are fed separately by a knife "which remains stationary while the peg-wood is being fed through the peg-trough against it by a follower actuated by a spring;" the end of the knife is flexible "so as to press each peg as it is cut off into the peg-tube and retain it therein in a position ready to be struck by the peg-driver;" the driver is brought down and the awl is

driven into the sole by a coiled spring surrounding the plunger.

The driving shaft runs in bearings in the framework, and on it is secured an adjustable dog. The upper end of the framework is bored for the reception of the coiled spring, whose lower end rests on a block which surrounds the plunger and is lifted by the dog. The upper end of the plunger projects through the framework and terminates in a screw carrying elastic washers and nuts. The peg-trough is secured to the bottom of the framework; its outer end is open for the admission of a strip of peg-wood. The strip is pressed forward by a finger "actuated by a flat spiral spring" which is pivoted to a circular plate "proceeding from the enlarged base of a lever." The inner end of the trough "has a passage formed in it for the peg-driver to work in," and the passage "is open to admit the pegs as they are cut off separately by the knife." The lever is pivoted on a pin projecting from the inner side of the framework; the under side of its base "is inclined downward" and has fastened to it an inclined bar "which is bent to form an elbow or foot-piece." The foot-piece is slotted for the passage of the awl and driver, and its under side rests on the sole to be pegged; it is cut with teeth to prevent it from sliding when resting thereon. The flattened end of the driving shaft passes through the lever, "where it revolves in an aperture closed on one side" by a plate screwed to the lever; "the throw" of the flattened portion within the aperture "determines the amount of vibration" of the lever upon the framework "and consequently the amount of feed or distance between two successive pegs." A screw and flat spring placed on opposite sides of the framework and lever prevent "any possibility of the awl and inner end of the peg-trough from coming in contact with the sides of the slot in the foot-piece." The knife is clamped to the base of the lever.

[Printed, &c. Drawing.]

A.D. 1866, December 20.—No. 3343.

CHAPMAN, WILLIAM.—"Improvements in the means or apparatus employed in 'beading the uppers' of boots and shoes and other articles." The apparatus described is

applicable "more particularly to beading the uppers around " the parts where the elastic is inserted."

The principal parts of the apparatus are (1) a pressing instrument; (2) three moveable plates; (3) a fixed plate; (4) a fixed or adjustable gauge. A groove is formed by means of the fixed and moveable plates; the material to be beaded is laid on the bed of the apparatus over the groove; the presser is caused to descend and press the material into the groove. When the presser rises, the moveable plates "approach the " fixed portion of the groove so as to nip the leather and " thereby complete the beading." The presser and the moveable plates are acted upon by cams and levers or by treadles connected by links thereto. The gauge facilitates the adjustment of the material in position over the groove.

The shape of the parts is to be varied according to the shape of the beading to be produced, and the material is to be " skived and soaped or pasted " before it is operated upon.

[Printed, 10d. Drawing.]

A.D. 1866, December 22.—No. 3381.

CLARK, WILLIAM.—(*A communication from George Washington Tolhurst.*)—(*Provisional protection only.*)—"Improvements in boots and shoes." The counter, heel, shank, and side strips are made in one piece of malleable iron or other metal. The side strips may extend as far as required; they may "surround the complete lower portion of the boot." The counter and side strips are made at their top edges with two serrated flanges, between which a groove is formed for the insertion of the upper; the teeth of the flanges are pressed into the leather. The arrangement of the teeth and groove admits of modification. The lower or wearing portion of the heel is of leather; it is secured to the metal portion by two metal straps which are fastened to the leather and dovetailed into the metal portion. A spring attached to either portion presses against a plate secured to the other portion and prevents the lower "from sliding off the metal heel." The insole is riveted to the inside of the heel and shank, and the outer sole to the front end of the shank. The lower portion of the heel may be fastened to the upper in other ways.

[Printed, 6d. Drawing.]

A.D. 1866, December 31.—No. 3445.

GOTTHEIMER, HENRY. — (*Provisional protection not allowed.*)—"Improvements in fur-lined overboots and over-shoes, the object of the invention being to keep the feet of the wearer warm whilst riding or walking or sitting." The uppers are of leather or other material, the linings of skin with the wool or fur on, and the soles of the same material as the uppers. If the article is made for wearing over a boot or shoe which has a heel, it is made with "a box or hollow heel." The fastening may be a string, or a strap and buckle, or elastic web.

It is proposed to make an overshoe of india-rubber or cloth to cover the toe and sides of a boot or shoe; it is intended to be put on before the foregoing is used "for the purpose of keeping the overboots or overshoes clean and dry."

[Printed, 4d. No Drawings.]

A.D. 1866, December 31.—No. 3451.

MILLER, JAMES, and MILLER, JAMES, junior.—"Improvements in the manufacture of elastic gussets," for use in boots and stays and for other purposes." These gussets are composed of lengths of vulcanized india-rubber cord and cases of leather or of woven fabric, one length of rubber only being used in each gusset, so that "the liability of the india-rubber to slip and work out" is much lessened.

The case is made of two pieces cut to the size required for the gusset when extended and for leaving a margin whereby it is sewn to the boot or stay. It is sewn across with parallel rows of stitches and is then contracted or crimped. The crimping is done by aid of "a machine with two jaws in a similar manner to a vice." One jaw is fixed, the other moveable. The jaws (by preference of wood) are flat on their upper surface. "When the jaws are closed, a row of teeth or pins of wire is driven into the upper surface of each jaw, the rows of teeth being made to correspond with the contour of the sides of the gusset." A wire "of a length somewhat greater than the width of the gusset and of the size of the cavity" is passed between each row of stitches. The jaws are opened; the case is laid on the machine by placing each wire between two of the teeth on each jaw; the jaws are screwed up close, and the case becomes crimped. The wires

are taken out, and the case is ready for filling with the length of cord which is passed backward and forward through the rows. The margin is pulled back and tacked down, and the gusset is complete.

To ensure accuracy the case, when taken off the machine, is laid on a table; a plate hinged to the table is turned over it and presses it down; the wires are drawn out, and the cord is inserted by the aid of a bodkin. The patentees describe the bodkin or needle which they prefer to use.

The margins may be strengthened by inserting at the ends of each row of stitches a strip of canvas; the wires and the cord pass through each strip; "the canvas is doubled over, and the margin or edge of the gusset will be composed of two thicknesses of canvas in addition to the fabric."

[Printed, 4d. No Drawings.]

APPENDIX.

A.D. 1788, June 30.—No. 1655.

STEDMAN, JOHN.—“A buckle chape or fastening for men “ and women’s shoes.” The “double chape” of this buckle is connected to the rim part by a butt joint so that the rim can be shut down on the chape or raised from it. The chape is made with a bar which projects on each side; and the bar carries a spring at its outer end, and the middle portion of the joint at its inner end. The rim or ornamental part of the buckle is made with a cross bar carrying a catch at its outer end, the other portions of the joint at its inner end, and near the inner end a spring “to throw open the rim or ornament “ from the double chape” and “to keep the false strap in.” The latter object is effected by means of a pin riveted to the spring at the end nearest the joint, and, when the buckle is shut, passing through a hole in the cross bar and running into the strap.

To apply this buckle, it is to be opened; the double chape is to be fastened to the straps of the shoe, and the rim is to be shut down on the chape. A knob on the spring at the outer end of the chape cross bar facilitates the opening of the buckle.

[Printed, 10d. Drawing.]

A.D. 1789, August 29.—No. 1700.

ELIN, JOHN.—“An improvement to shoe buckles.” A thin bar of metal is fixed across the rim of the buckle “under that “ side opposite to where the tongue of the chape points “ and parallel with the wire of the chape”; it carries one or more small points “whose direction is from the centre of the “ buckle.” The bar is fixed at such a distance under the rim as to admit the thickness of a shoe strap between them.

When the shoe is buckled, the free end of the strap is drawn through between the rim and the bar, and “it then requires “ to be tucked under the bar and forced upon the points.” The pressure of the buckle upon the foot “effectually prevents “ the strap from flying out.”

[Printed, 6d. Drawing. See Rolls Chapel Reports, 6th Report, p. 180.]

A.D. 1811, October 30.—No. 3501.

DAVIES, THOMAS.—“Improvements in the construction of “buckles for various purposes.” This buckle consists of a rim and a frame hinged to one side of the rim. The frame carries a longitudinal bar which projects at each end and is provided with “upright studs or points.” These studs when the frame is pressed down on to the rim (“the straps of the “shoe being drawn either tight or slack at the option of the “wearer”) pass through the straps into corresponding holes made in a bar which crosses the rim. A button and spring on the side of the rim opposite the point holds down the frame, and keeps all secure “without the necessity of either tongue “or chape.”

[Printed, 6d. Drawing. See Rolls Chapel Reports, 8th Report, p. 88.]

A.D. 1820, April 29.—No. 4451.

HANCOCK, THOMAS.—“An application of a certain material “to various articles of dress and other articles that the same “may be rendered more elastic.” The material is caoutchouc cut into slips of suitable length and thickness. If the quality of the caoutchouc “is not of the best,” or if the spring “is not “required to be very substantial,” the slips are steeped a while in hot water to prevent their cracking on the edges.

The slips are usually enclosed in cases “made as long as it “is necessary the spring should stretch,” and fastened thereto at the extremities. The cases may be separate or made in the article to which the spring is to be applied.

These springs are applicable to wrists of gloves, vests, waistbands, wrists of sleeves, mouths of pockets, knees of breeches and drawers, braces, trouser and gaiter straps, shirt wrists, stiffeners for neckcloths, stockings, garters, and stays; they may be used also instead of ties for boots, shoes, clogs, and pattens.

In the latter part of the Specification the patentee says, “I apply caoutchouc to the soles of boots, shoes, and clogs “by making either the whole sole of caoutchouc or the inner “or outer sole only, or by fastening a piece of caoutchouc “between the soles, and in either case boots, shoes, or clogs “are rendered more elastic to the foot.”

[Printed, 4d. No Drawings. See Repertory of Arts, vol. 10 (*second series*), p. 14; London Journal (*Newton's*), vol. 2, p. 7; Webster's Reports, vol. 1, p. 500 (*note*).]

A.D. 1858, September 9.—No. 2046.

WRIGHT, JOSEPH, senior, and WRIGHT, JOSEPH, junior.—
“Improvements in machinery and apparatus used for preparing fabrics or materials to receive eyelet holes or fastenings, and fixing eyelet holes and in fastenings for stays and other articles.” This invention will be found abridged in Division II. of this series; one part of it however claims admission into this division, being an arrangement “useful when preparing the uppers of boots to receive eyelets,” as it is then desirable “that the holes should at the commencement be placed comparatively close together, and that the distance between them should be progressively increased up to the termination of the line of holes.”

On the bed die are two arms, one on each side, each turning on a centre and carrying a pin at its forward end. These arms have “segments of screw wheels formed or fixed on them.” A screw so arranged “as to be capable of being put into gear with the working parts of the machine, in order that it may be moved a step forward after every descent of the cutting punch,” gears with the segments, causing the pins to move either to or from the die according to the direction in which the screw is turned. A screw stop mounted on the bed die regulates “the distance of the holes from the edge of the work.”

Pliers for punching holes are made in like manner, with three gauges “for adjusting the distances of the holes from each other and from the edge.”

The eyelets are threaded on a wire “suspended from a convenient point above the machine;” they pass down a tube on to the upper plate of a slide. This plate has in it a slot, “which is too narrow to allow the flanges of the eyelets to pass through it; but at one end of the slot is an enlargement which gives sufficient space for this purpose,” and when it comes under the end of the tube, it allows an eyelet to fall through on to the lower plate; at the next motion this plate passes from under the eyelet which then falls on to the nipple.

A.D. 1863, October 21.—No. 2579.

CLARKSON, THOMAS CHARLES. — "Improvements in the manufacture of saddles and harness, and in materials for and in ornamenting the same, which improvements are applicable for parts of carriages, dress, and coverings for the head and other articles." The patentee employs in the manufacture of these articles a material composed of alternate layers of canvas and sheet cork united "with a solution of india-rubber mixed with or without sulphur, chloride of lime, or antimony." The exterior is covered with leather or with woven material.

The manufacture of saddles, &c., will be found in the series entitled Saddlery, Harness, &c., that of coverings for the head in the first division of the present series.

The ornamentation is effected "by indenting with a toothed wheel or other pricking machine making small holes," and by filling the holes with white or coloured cement; this "has the appearance of sewing, but of a more ornamental character." The toothed wheel or prickers are heated "when applied to india-rubber shoes or goloshes."

The patentee states towards the end of his Specification that his improvements "are also applicable for stiffening coats, trousers, leggings, boots and shoes, ladies' skirts, and various parts of wearing apparel."

[Printed, 1s. Drawings.]

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 Dorchester (*County Museum and Library*).
 — (*Working Men's Institute*).
 Dudley (*Mechanics' Institution*).
 Dukinfield (*Village Library and Reading Room*).
 Dumbarton (*Philosophical and Literary Society*).
 Dumfries (*Mechanics' Institution*).

Dunfee (*Young Men's Christian Association and Literary Institution*).
 Durham (*Mechanics' Institute*).
 Eagley, Bolton-le-Moors (*Library and Institute*).
 Ealing (*Mechanics' Institute*).
 Earlestown, Newton-le-Willows (*Mutual Improvement Society*).
 East Greenwich (*Working Men's Institute*).
 East Relford (*Literary and Mutual Improvement Society*).
 Ebbw Vale (*Literary and Scientific Institute*).
 Edinburgh (*Philosophical Institution*).
 — (*Royal Scottish Society of Arts*).
 — (*Subscription Library*).
 — (*Watt Institution and School of Art*).
 — (*Working Men's Club*).
 Egham (*Literary Institute*).
 Egremont (*Mechanics' Institute*).
 — (*Workmen's Institute*).
 Exeter (*Devon and Exeter Albert Memorial Museum, School of Science and Art, and Free Library*).
 — (*Devon and Exeter Institution*).
 Farnham (*Young Men's Association*).
 Faversham (*Institute*).
 Fowey (*Working Men's Reading Rooms*).
 Frome (*Literary and Scientific Institution*).
 — (*Mechanics' Institution*).
 Gainsborough (*Literary, Scientific and Mechanics' Institute*).
 Garforth, near Leeds (*Working Men's Club*).
 Glasgow (*Athenaeum*).
 — (*Central Working Men's Club and Institute*).
 — (*City Industrial Museum, Kelvington Park*).
 — (*Institution of Engineers in Scotland*).
 — (*Mechanics' Institution, Bath Street*).
 — (*Philosophical Society*).
 Glastonbury (*Literary Institute*).
 Godmanchester (*Working Men's Reading Room*).
 Gosport (*Gosport and Alverstoke Literary and Scientific Institution*).
 Grantham (*Public Literary Institution*).
 Gravesend (*Gravesend and Milton Library and Reading Rooms*).
 Guernsey (*Working Men's Association*).
 Guildford (*Working Men's Institution*).
 Hadleigh (*The Reading Room*).
 Halesworth (*Mechanics' Institute*).
 Halifax (*Literary and Philosophical Society*).
 — (*Mechanics' Institute*).
 — (*Working Men's College*).
 Halstead (*Literary and Mechanics' Institute*).
 Haslingdon (*Institute*).
 Hastings (*Literary and Scientific Institute*).
 Hastings (*Mechanics' Institution*).
 Hawarden (*Literary Institution*).
 Hebbden Bridge, near Todmorden (*Mechanics' Institution*).
 Helston (*Reading Room and Library*).
 Hemel Hempstead (*Mechanics' Institute*).
 Hereford (*Natural History, Philosophical, Antiquarian, and Literary Society*).
 Hertford (*Literary and Scientific Institution*).
 Heywood (*Mechanics' Institute*).
 Hitchin (*Mechanics' Institute*).
 Holbeck (*Mechanics' Institution*).
 Hollingwood (*Working Men's Club*).
 Holt, Norfolk (*Literary Society*).
 Holywell Green (*Mechanics' Institution*).
 Horncastle (*Mechanics' Institution*).
 Huddersfield (*Mechanics' Institution*).
 Hull (*Church Institute*).
 — (*Literary, Scientific, and Mechanics' Institute*).
 — (*Lyceum Library*).
 — (*Royal Institution, Albion Street*).
 — (*Young People's Institute*).
 Huntingdon (*Literary and Scientific Institution*).
 Ipswich (*Working Men's College*).
 Kendal (*Christian and Literary Institute*).
 — (*Highgate Mechanics' Institute*).
 — (*Working Men's Institute*).
 Kidderminster (*Mechanics' Institute*).
 Lancaster (*Mechanics' Institute and School of Science*).
 Lee, Kent (*Working Men's Institution*).
 Leeds (*Chapeltown Branch Library*).
 — (*Church Institute*).
 — (*Holbeck Branch Library*).
 — (*Hunslet Branch Library*).
 — (*Leeds Library*).
 — (*Mechanics' Institution and Literary Society*).
 — (*Philosophical and Literary Society*).
 — (*Working Men's Institute*).
 — (*Young Men's Christian Association*).
 Leek, Staffordshire (*Literary and Mechanics' Institution*).
 Leicester (*Law Society*).
 — (*Young Men's Christian Association*).
 Leighton Buzzard (*Working Men's Mutual Improvement Society*).
 Leith (*Mechanics' Subscription Library*).
 Lewes (*Fitzroy Memorial Library*).
 — (*Mechanics' Institute*).
 — (*School of Science and Art*).
 Lincoln (*Mechanics' Institute*).
 Liverpool (*Institute*).
 — (*Medical Institution*).
 — (*Polytechnic Society*).
 Llanelly (*Chamber of Commerce and Reading Room*).
 Lockwood (*Mechanics' Institution*).

London (*Albert Working Men's Club, Knightsbridge*).
 ——— (*Bank of England Library and Literary Association*).
 ——— (*Beaumont Institute, Mile End*).
 ——— (*Bedford Working Men's Institute, Spitalfields*).
 ——— (*Birkbeck Institution, Southampton Buildings, Chancery Lane*).
 ——— (*Bow and Bromley Road Institute, Bow Road*).
 ——— (*Bow Common Working Men's Club, Devon's Road, Bow Common*).
 ——— (*Christchurch Working Men's Club, New Street Lark Hall Lane, Clapham*).
 ——— (*Clerkenwell Club, Lower Rosoman Street*).
 ——— (*Holloway Working Men's Club and Institute, Holloway Road*).
 ——— (*Literary and Scientific Institution, Watworth*).
 ——— (*London Association of Foremen Engineers and Draughtsmen*).
 ——— (*London Institution, Finsbury Circus*).
 ——— (*London Library, St. James's*).
 ——— (*Royal Institute of British Architects, Conduit Street, Hanover Square*).
 ——— (*St. James and Soho Working Men's Club, Rupert Street, Soho*).
 ——— (*St. Mary Charterhouse Working Men's Club, Golden Lane*).
 ——— (*South London Working Men's College, Blackfriars Road*).
 ——— (*Southwark Working Men's Club, Broadwall, Stamford Street*).
 ——— (*Working Men's Club, Brixton Hill*).
 ——— (*Working Men's Club, St. Mark's, Victoria Docks*).
 ——— (*Working Men's Club and Institute, Battersea*).
 ——— (*Working Men's Club and Institute Union, Strand*).
 ——— (*Working Men's Club, Triangle, Hackney*).
 ——— (*Working Men's College, Great Ormond Street*).
 Longwood (*Mechanics' Institution*).
 Lowestoft (*Library and Reading Room*).
 Lye (*Institution*).
 Lynton (*Literary Institute*).
 Madeley, Shropshire (*Amstee Memorial Workmen's Club and Institute*).
 Maidstone (*St. Paul's Literary Institute*).
 ——— (*Working Men's Club and Institute*).
 Maldon, Essex (*Literary and Mechanics' Institute*).
 Manchester (*Ancients Branch Free Library*).
 ——— (*Athenæum*).
 ——— (*Campfield Free Lending Library*).
 ——— (*Cheetham Branch Library*).

Manchester (*Chorlton and Ardwick Branch Free Library*).
 Manchester (*Hulme Branch Free Library*).
 ——— (*Law Library*).
 ——— (*Mechanics' Institution*).
 ——— (*Natural History Museum, Peter Street*).
 ——— (*Open's College*).
 ——— (*Portico Library, Mosley Street*).
 ——— (*Rochdale Road Branch Free Library*).
 ——— (*Royal Exchange Library*).
 ——— (*Scientific and Mechanical Society*).
 Manningtree (*Manningtree and Mistley Literary and Scientific Institution*).
 Mansfield (*Co-operative Industrial Society*).
 ——— (*Mechanics', Artizans', and Apprentices' Library*).
 ——— (*Mechanics' Institute*).
 Marlborough (*Reading and Mutual Improvement Society*).
 ——— (*Working Men's Hall*).
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 Mere, near Bath (*Literary Association*).
 Middlesbrough (*Iron and Steel Institute*).
 ——— (*Mechanics' Institution*).
 Middlewich (*Literary and Scientific Institution*).
 Modbury (*Mechanics' Institution*).
 Mossley (*Mechanics' Institute*).
 Newark (*Mechanics' Institute*).
 Newbury (*Literary and Scientific Institution*).
 Newcastle-upon-Tyne (*Mechanics' Institution*).
 ——— (*Working Men's Club*).
 New Mills, near Stockport (*Mechanics' Institute*).
 Newport, Isle of Wight (*Young Men's Society and Reading Room*).
 Northampton (*Mechanics' Institute*).
 North Shields (*Free Library*).
 Nottingham (*Mechanics' Institution*).
 ——— (*Subscription Library, Bromley House*).
 Oldham (*Mechanics' Institution, Werneeth*).
 Ormskirk (*Public Library*).
 Oswestry (*Institute*).
 Over, Cheshire (*Working Men's Institute*).
 Oxford (*North Oxford Working Men's Club*).
 Patricroft (*Mechanics' Institution*).
 Pembroke Dock (*Mechanics' Institute*).
 Pendleton (*Mechanics' Institution*).

- Penzance (*Institute*).
 ——— (*Penzance Library*).
 ——— (*Working Men's Association*).
 Perth (*Mechanics' Library, High Street*).
 Peterborough (*Mechanics' Institution*).
 Plymouth (*Working Men's Institute*).
 Pontypool (*Literary Institute*).
 Poole (*Literary and Scientific Institution*).
 ——— (*Mechanics' Institute*).
 Port Glasgow (*Public Library*).
 Portsea Island (*Young Men's Christian Association*).
 Preston (*Institution for the Diffusion of Knowledge*).
 Redruth (*Redruth Institution*).
 Reigate (*Mechanics' Institution*).
 Richmond (*Working Men's College*).
 Rotherham (*Rotherham and Masbro' Literary and Mechanics' Institute*).
 Royston (*Institute*).
 Rusholme (*Public Hall and Library*).
 Ryde, Isle of Wight (*Philosophical and Scientific Society*).
 ——— (*Young Men's Christian Association and Literary Institute*).
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 St. Just (*Institution*).
 St. Leonards (*Mechanics' Institution*).
 ——— (*Working Men's Club*).
 Salford (*Working Men's Club*).
 Salisbury (*Literary and Scientific Institution*).
 Saltaire (*Literary Institute*).
 Scarborough (*Mechanics' and Literary Institute, Vernon Place*).
 Selby (*Mechanics' Institute*).
 Sevenoaks (*Literary and Scientific Institution*).
 Shaftesbury (*Literary Institution*).
 Sheerness (*Literary Institute*).
 Sheffield (*Branch Free Library*).
 ——— (*Brightside Branch Library*).
 ——— (*Literary and Philosophical Society, School of Arts*).
 ——— (*Mechanics' Institution*).
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 Sidmouth (*Mechanics' Hall*).
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 Slough (*Mechanics' Institute*).
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 ——— (*Workmen's Hall*).
 Southport (*Athenæum*).
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 ——— (*Christian Young Men's Association*).
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 Staines (*Literary and Scientific Institution*).
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 Stamford (*Institution*).
 Stourbridge (*Associated Institute*).
 ——— (*Church of England Association*).
 ——— (*Iron Works Reading Room and Library*).
 ——— (*Mechanics' Institution*).
 ——— (*Working Men's Institute*).
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 Stratford (*Working Men's Hall*).
 Sudbury, Suffolk (*Literary and Mechanics' Institute*).
 Sunderland (*Working Men's Club*).
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 Todmorden (*Mechanics' Institution*).
 Truro (*Cornwall County Library*).
 ——— (*Institution*).
 ——— (*Royal Institution of Cornwall*).
 Tunbridge (*Literary and Scientific Institute*).
 ——— (*Mechanics' Institute*).
 Tunbridge Wells (*Mechanics' Institution*).
 ——— (*Society of Literature and Science*).
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 Walsall (*Free Library*).
 Walsham-le-Willows, Suffolk (*Institute*).
 Ware (*Institute*).
 Warminster (*Athenæum*).
 Watford (*Literary Institute*).
 ——— (*Public Library*).
 Wellingborough (*Working Men's Club*).
 Wellington (*Young Men's Christian Association*).
 Wells, Somerset (*Young Men's Society*).
 West Bromwich (*Free Library*).
 Whaleybridge (*Mechanics' Institute*).
 Whitby (*Institute*).
 ——— (*Museum*).
 ——— (*Subscription Library*).
 Whitehaven (*Mechanics' Institute*).
 ——— (*Working Men's Reading Room*).

Whitstable (*Institute*).
 Wilton (*Literary Institute*).
 Winchester (*Mechanics' Institution*).
 ——— (*Training College*).
 Winsford (*Town Hall Reading Room*).
 Wirksworth (*Mechanics' Institution*).
 Wisbeach (*Mechanics' Institute*).
 Witham (*Literary Institution*).
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